DMS-DR-1027

—SPACE SHUTTLE—

—SPACE SHUTTLE—

STATIC STABILITY AND CONTROL INVESTIGATION FOR THE NORTH AMERICAN ROCKWELL DELTA WING (134B) AND STRAIGHT WING (130G) SPACE SHUTTLE ORBITERS

MARSHALL SPACE FLIGHT CENTER

WIND TUNNEL TEST RESULTS
DATA REPORT

OCTOBER, 1970

CONTRACT NAS8-4016
SCHEDULE II
DRL 184-58
AMENDMENT 130
MARSHALL SPACEFLIGHT CENTER

SADSAC SPACE SHUTTLE
AEROTHERMODYNAMIC
DATA MANAGEMENT SYSTEM

SPACE DIVISION CHRYSLER CORPORATION

DMS-DR-1027
OCTOBER 1970

SADSAC/SPACE SHUTTLE

WIND TUNNEL TEST DATA REPORT

CONFIGURATION: Delta Wing (134B) and Straight Wing (130G) Orbiter Shuttle Models

TEST PURPOSE: Static Stability and Control Investigation

MODEL SCALE: .0035

MACH NUMBER RANGE: .6 - 5.0

TEST FACILITY: MSFC 14 Inch Trisonic Wind Tunnel

TESTING AGENCY: MSFC for North American Rockwell Corp.

TEST NO. & DATE: Test No. 468 - Sept. 16, October 9, 1970

TEST CONDUCTOR(S): E. C. Allen, D. C. Olsen

DATA MANAGEMENT SERVICES

LIAISON: John E. Hord
John E. Hord
Aero Thermo Data Group

DATA OPERATIONS: N/A

RELEASE APPROVAL:
N. D. Kemp, Supervisor
Aero Thermo Data Group

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ABSTRACT

The 0.0035 scale models of the North American Rockwell Delta Wing (134B) and Straight Wing (130G) Space Shuttle Orbiters were tested in the MSFC 14 inch trisonic wind tunnel during the period from September 16 to October 9, 1970. The test was conducted as a static stability and control investigation over a Mach range of 0.60 to 5.00. The straight wing orbiter was tested in the body alone, body-wing, body-wing-horizontal stabilizer, and body-wing-horizontal stabilizer-vertical stabilizer configurations. The delta wing orbiter was tested in the body alone, body-wing (clipped tip), body-wing (complete delta wing), and body-wing-vertical stabilizer configurations. The models were pitched over an angle of attack range of 0° to 60° at a fixed sideslip angle of 0°, and also yawed over an angle of sideslip range of -4° to 10° at fixed angles of attack of 0°, 10°, 15°, 30°, 45°, and 60°.

TEST CONDITIONS
TEST TWT-468

MACH NUMBER	REYNOLDS NUMBER	DYNAMIC PRESSURE (pounds/sq. inch)	STAGNATION TEMPERATURE (degrees Fahrenheit)
0.60	9.2×10^6/ft	7.32	65
0.60	7.0×10^6/ft	5.59	70
0.60	4.9×10^6/ft	3.97	68
0.90	7.4×10^6/ft	8.00	71
1.20	7.0×10^6/ft	8.98	76
1.46	6.6×10^6/ft	9.56	71
1.96	8.9×10^6/ft	12.79	87
2.99	4.4×10^6/ft	4.95	84
4.96	6.1×10^6/ft	3.40	86

BALANCE UTILIZED: Task 0.7-inch MK I-B Six Component

	CAPACITY:	ACCURACY:	COEFFICIENT TOLERANCE:
NF	400 lbs		0.3%
SF	100 lbs		0.3%
AF	15 lbs		0.3%
PM			0.3%
YM			0.3%
RM	70 in lbs		0.3%

COMMENTS:

No satisfactory method is known for determining the absolute accuracy of the final data coefficients.

DATA REDUCTION

Measured data were reduced about the body and stability axis systems. The reference data used to reduce the data were dependent upon the body configuration (B5 or B6) tested; their reference data are listed below:

Straight Wing Orbiter (B6)

$S_{ref} = S_W$ = wing area = 5.440 in^2

$\ell_{ref} = \bar{c}_W$ = wing MAC = 1.130 in

$b = b_W$ = wing span = 5.215 in

Delta Wing Orbiter (B5)

$S_{ref} = S_W$ = wing area = 10.732 in^2

$\ell_{ref} = \bar{c}_W$ = wing MAC = 2.874 in

$b = b_W$ = wing span = 4.980 in

The model moment reference point (MRP) for the Straight Wing Orbiter is 4.526 inches aft of the nose, on the lateral centerline, and -0.178 inches below the Fuselage Reference Plane (FRP). The model moment reference point for the Delta Wing Orbiter is 4.979 inches aft of the nose, on the lateral centerline, and 0.4550 inches above the Fuselage Reference Plane (FRP).

Angle of attack and angle of slideslip were corrected for sting and balance deflections, and axial force was corrected for weight tares.

DATA VALIDITY ANALYSIS

The following runs were eliminated from the SADSAC input data deck because of wind tunnel wall interference problems:

Run No.	Run No.
90	97
91	98
96	99

The difference in the attachments of the model for alpha schedules A and D is in evidence in the axial force coefficient and pitching moment coefficient data. This trend appears to decrease with model component buildup and increasing Mach number.

The data values for XCP/L and L/D are excessive for angle of attack values near zero for Run Numbers 198, 235 and 9; these values were obtained by dividing by very small values of the dependent variables. These excessive values were not plotted in this data report.

CONFIGURATIONS INVESTIGATED

NOMENCLATURE - Straight Wing Orbiter

B6	Basic 9992-130C body with attach points for a centerline vertical, horizontal, and low-mount wing. Also included is a canopy on the upper surface aft of the nose.
W10	9992-130C straight wing located in the 9992-130G position on body B6
H12	9992-130C straight wing orbiter horizontal stabilizer used with body B6. The surface is located on the vehicle FRP, with the pivot axis at Fus. Sta. 1917.87 in.
V5	9992-130C straight wing orbiter vertical stabilizer used with body B6. The surface is located on the vehicle centerline.

NOMENCLATURE - Delta Wing Orbiter

B5	9992-134B body. Delta wing orbiter body including a canopy on the upper surface aft of the nose.
W13	9992-134B delta wing located on body B5.
W14	9992-134B delta wing which is the same as wing W13 except modified to a complete delta (no clipped tip). Used with body B5.
E2	Elevon used with the 9992-134B delta wing (W13).
E3	Elevon used with the 9992-134B complete delta (no clipped tip) wing (W14).
V14	Vertical stabilizer fins located on the outboard tip of the 9992-134B delta wing (W13).
R4	Rudder located on vertical stabilizer V14.
V16	Centerline vertical stabilizer with the basic trailing edge; used with body B5.
V17	Centerline vertical stabilizer with the 5° (half angle) wedge trailing edge; used with body B5.

CONFIGURATIONS INVESTIGATED (continued)

NOMENCLATURE - Delta Wing Orbiter (continued)

V18	Centerline vertical stabilizer with the 20° (half angle) wedge trailing edge; used with Body B5.
V19	Centerline vertical stabilizer with the 35° (half angle) wedge trailing edge; used with body B5.

Refer to the immediately following pages for dimensional data and drawings on the above components.

COMBINATIONS TESTED

Straight Wing Orbiter	Delta Wing Orbiter
B6	B5
B6W10	B5W13E2
B6W10H12	B5W14E3
B6W10H12V5	B5W13E2V14R4
	B5W14E3V16
	B5W14E3V17

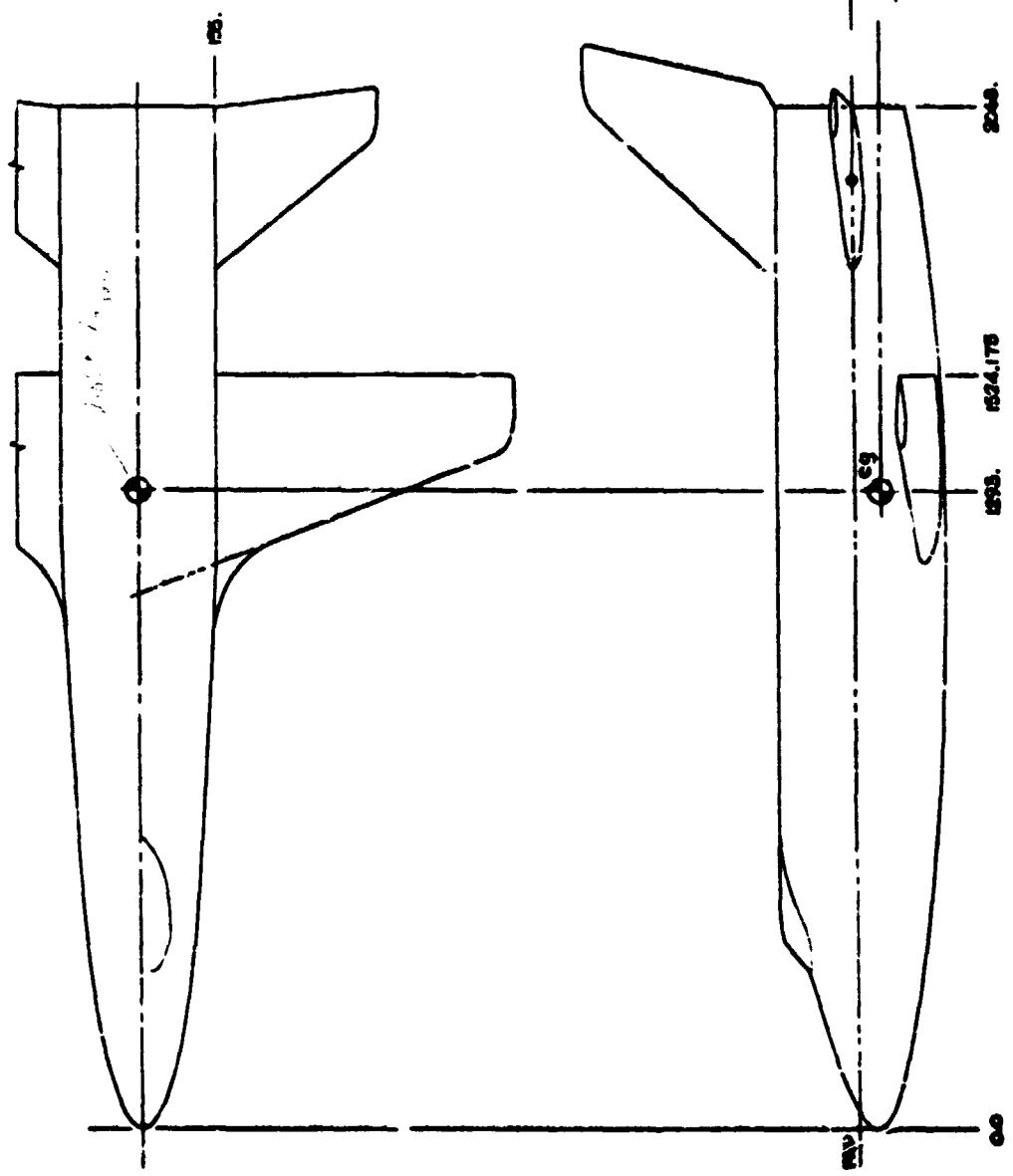
The above configurations were tested at horizontal stabilizer deflections -50°, -40°, -35°, -30°, -20°, -10°, 0°, 10° and 20°, aileron deflections of 0° and -15°, elevator deflections -45°, -30°, -15°, -7.5°, 0°, and 15°, rudder deflections -20°, -10°, and 0°, and vertical stabilizer trailing edge outboard 0°, 10° and 20°. The models were tested for an angle of attack range of 0° to 60° at a fixed sideslip angle of 0° and for a sideslip angle range of -4° to 10° at fixed angles of attack of 0°, 10°, 15°, 30°, 45°, and 60°.

FIGURE 1

STRAIGHT WING SSV ORBITER

Reference Drawing 9992-130C

Note: Wing is in -1.20G position



MODEL COMPONENT: BODY - B6

GENERAL DESCRIPTION: Basic 9992-130C body. Straight wing orbiter body with attach points for a centerline vertical, horizontal, and low-mount wing. Also included is a canopy on the upper surface aft of the nose. The model scale factor is 0.0035.

DRAWING NUMBER: Lines Dwg. 9992-130C

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Length, in.	2068.00	7.238
Max. Width, in.	310.00	1.086
Max. Depth, in.	340.34	1.191
Fineness Ratio	6.037	6.037
Area		
Max. Cross-Sectional, ft^2 (Fus. Sta. 1143.23 in.)	640.03	0.00784
Planform	-	-
Wetted	-	-
Base		

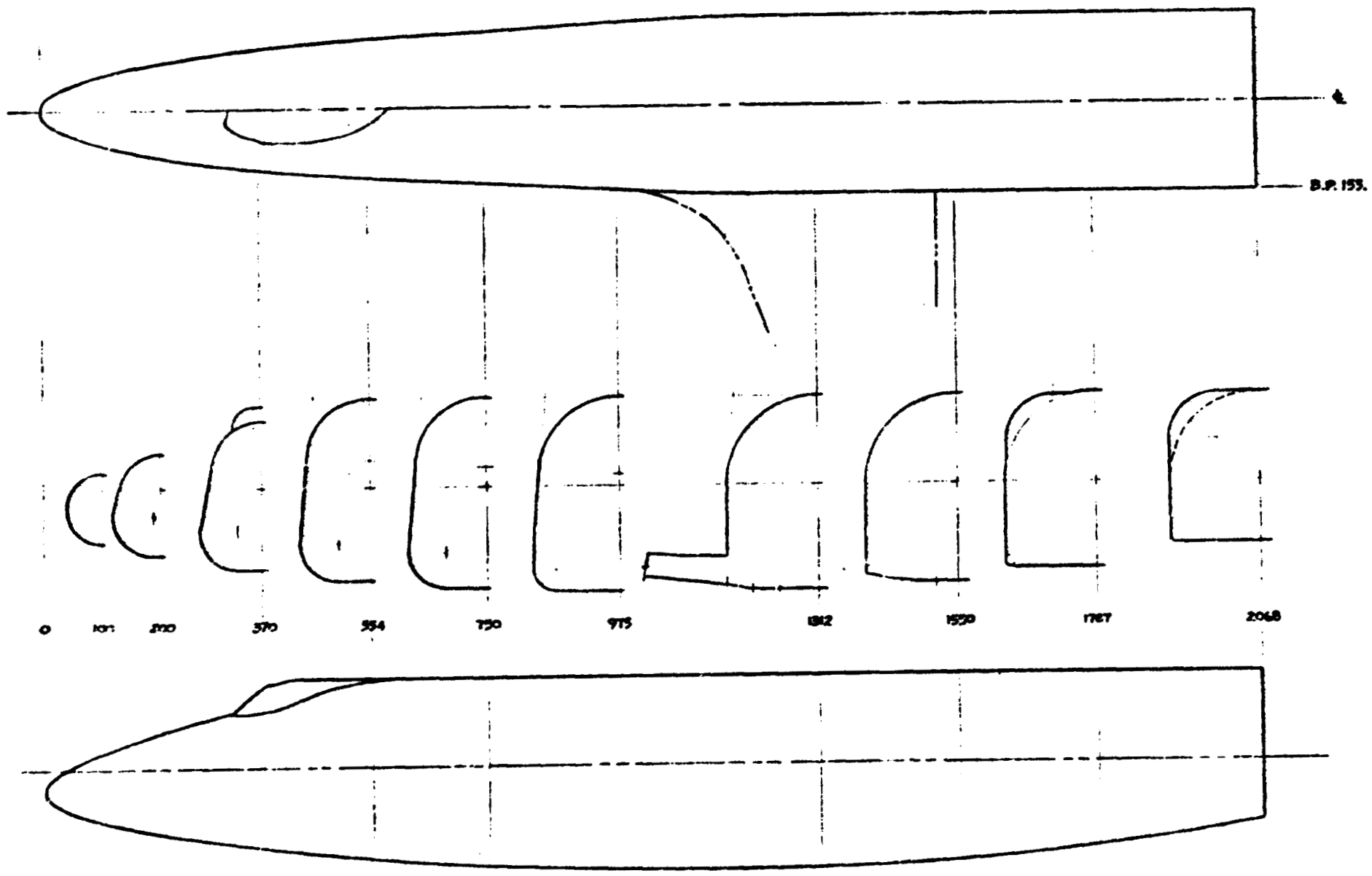


FIGURE 2 BODY B6 9992-130 C CONFIGURATION

MODEL COMPONENT: WING - W_{10}

GENERAL DESCRIPTION: 9992-130C straight wing located in the 9992-130G position on body B6. The total and exposed data do not include the leading edge cuff data which is listed below. The model scale factor is 0.0035.

DRAWING NUMBER: Lines Dwg. 9992-130C and 9992-130G

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform (equiv. true), ft^2	3084.00	0.037779
Wetted		
Span (equivalent), in.	1489.82	5.214
Aspect Ratio	4.961	4.961
Rate of Taper	0.397	0.397
Taper Ratio	0.333	0.333
Dihedral Angle, degrees	7.0	7.0
Incidence Angle, degrees	0.0	0.0
Aerodynamic Twist, degrees (about T.E.)		
~~Toe-In Angle~~ @ B.P. 155.06 in.	4.0	4.0
~~Gen's Angle~~ @ B.P. 745.07 in.	0.0	0.0
Sweep Back Angles, degrees		
Leading Edge	21.672	21.672
Trailing Edge	0.0	0.0
0.25 Element Line	16.596	16.596
Chords:		
Root (Wing Sta. 0.0), in.	447.20	1.565
Tip, (equivalent)(Wing Sta. 750.50 in.), in.	148.97	0.521
MAC, in. (Wing Sta. 312.68 in.), in.	322.95	1.130
Fus. Sta. of .25 MAC, in.	1282.00	4.487
W.P. of .25 MAC, in.	-148.87	-0.521
B.L. of .25 MAC, in.	310.35	1.086
Airfoil Section		
Root	NACA 0012-64	NACA 0012-64
Tip	NACA 0012-64	NACA 0012-64
EXPOSED DATA		
Area (equiv. true), ft^2	2222.00	0.02722
Span, (equivalent), in.	1179.70	4.129
Aspect Ratio	4.385	4.385
Taper Ratio	0.387	0.387
Chords		
Root (Wing Sta. 156.22 in.) in.	385.12	1.348
Tip (equiv.)(Wing Sta. 750.50 in), in.	148.97	0.521
MAC (Wing Sta. 409.57 in.), in.	284.45	0.996
Fus. Sta. of .25 MAC, in.	1310.84	4.588
W.P. of .25 MAC, in.	-137.06	-0.480
B.L. of .25 MAC, in.	406.52	1.423
LEADING EDGE CUFF		
Area, ft^2	31.79	0.00039
L.E. Intersects Fuselage ML @ Fus. Sta, in.	1027.46	3.596
L.E. Intersects Wing L.E. @ Fus. Sta, in.	1182.20	4.138

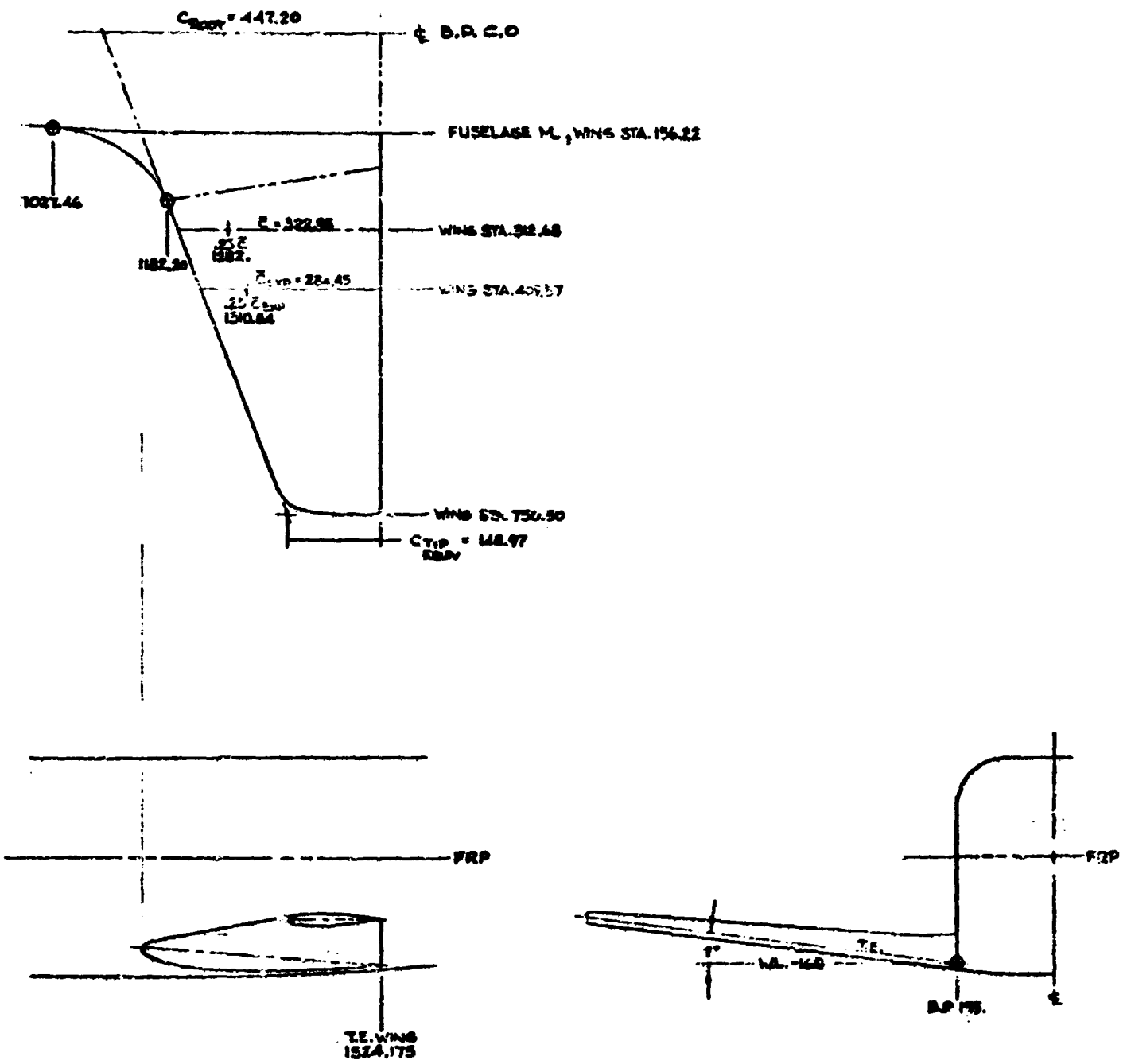


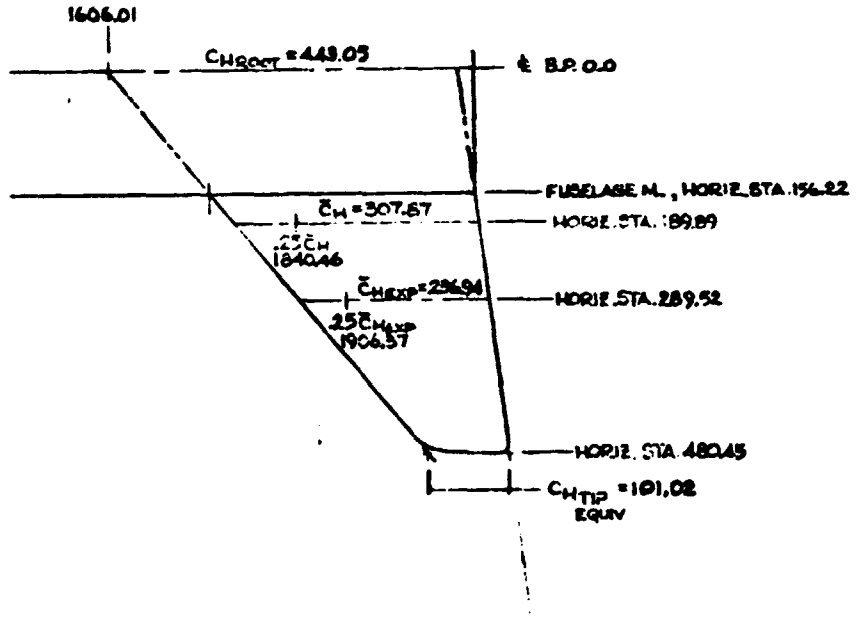
FIGURE 3 WING W10 9992-130 C CONFIGURATION
9992-130 G WING POSITION

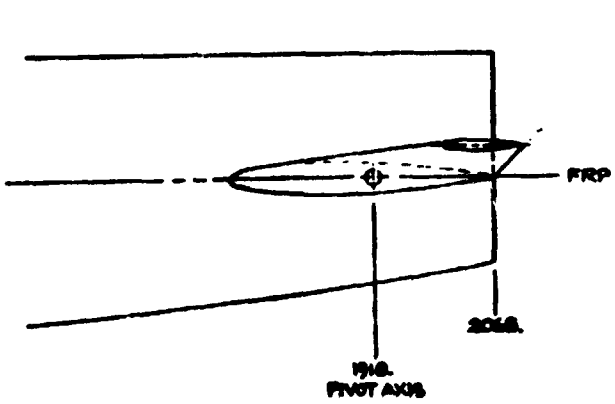
MODEL COMPONENT: HORIZONTAL STABILIZER - H_{12}

GENERAL DESCRIPTION: 9992-130C straight wing orbiter horizontal stabilizer used with body B6. The surface is located on the vehicle FRP, with the pivot axis at Fus. Sta. 1917.87 in. The model scale factor is 0.0035.

DRAWING NUMBER: Lines Dwg. 9992-130C

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform (equiv. true), ft^2	1816.00	0.02225
Wetted		
Span (equivalent) in.	953.76	3.338
Aspect Ratio	3.480	3.480
Rate of Taper	0.712	0.712
Taper Ratio	0.228	0.228
Dihedral Angle, degrees	7.0	7.0
Incidence Angle, degrees	0.0	0.0
Aerodynamic Twist, degrees	0.0	0.0
Toe-In Angle	-	-
Cant Angle	-	-
Sweep Back Angles, degrees		
Leading Edge	40.00	40.00
Trailing Edge	6.90	6.90
0.25 Element Line	33.220	33.220
Chords: Horiz.		
Root (~~Hinge~~ Sta. 0.0), in.	443.05	1.551
Tip, (equivalent)(Horiz.Sta.480.45in),in.	101.02	0.354
MAC, in.(Horiz.Sta. 189.89 in.),in.	307.87	1.078
Fus. Sta. of .25 MAC, in.	1840.46	6.442
W.P. of .25 MAC, in.	4.12	0.014
B.L. of .25 MAC,in.	188.47	0.660
Airfoil Section		
Root	NACA 0012-64	NACA 0012-64
Tip	NACA 0012-64	NACA 0012-64
EXPOSED DATA		
Area (equiv. true), ft^2	967.35	0.01185
Span, (equivalent), in.	638.88	2.236
Aspect Ratio	2.93	2.93
Taper Ratio	0.304	0.304
Chords		
Root(Horiz. Sta. 156.22 in), in.	331.84	1.161
Tip(equiv)(Horiz.Sta. 480.45in.),in.	101.02	0.354
MAC (Horiz. Sta. 289.52 in.), in.	236.94	0.829
Fus. Sta. of .25 MAC, in.	1906.37	6.672
W.P. of .25 MAC, in.	16.26	0.057
B.L. of .25 MAC, in.	287.37	1.006





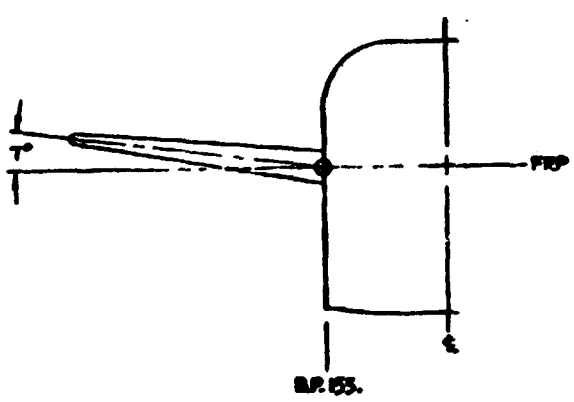


FIGURE 4
HORIZONTAL STABILIZER H12 9992-130C CONFIGURATION

MODEL COMPONENT: VERTICAL STABILIZER - V_5

GENERAL DESCRIPTION: 9992-130C straight wing orbiter vertical stabilizer used with body B6. The surface is located on the vehicle centerline. The total data includes the void area listed below. The model scale factor is 0.0035.

DRAWING NUMBER: Lines Dwg. 9992-130C

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform (equiv. true), ft^2	694.00	0.00850
Wetted		
Span (equivalent)in.	385.60	1.350
Aspect Ratio	1.488	1.488
Rate of Taper	0.721	0.721
Taper Ratio	0.302	0.302
Diehedral Angle, degrees	-	-
Incidence Angle, degrees	-	-
Aerodynamic Twist, degrees	-	-
Toe-In Angle , degrees	0.0	0.0
Cant Angle, degrees	0.0	0.0
Sweep Back Angles, degrees		
Leading Edge	43.250	43.250
Trailing Edge	12.417	12.417
0.25 Element Line	37.255	37.255
Chords: W.P. 154.40 in.), in.		
Root (~~Wing Sta. 0.0~~)	398.03	1.393
Tip, (equivalent)(W.P.540.00in)in.	120.19	0.421
MAC, in.(W.P. 312.75 in.), in.	283.94	0.994
Fus. Sta. of .25 MAC, in.	1931.90	6.762
W.P. of .25 MAC, in.	312.75	1.095
B.L. of .25 MAC, in.	0.0	0.0
Airfoil Section		
Root (W.P. 154.40 in.)in.	NACA 0015-64	NACA 0015-64
Tip (W.P. 541.39 in.)in.	NACA 0010-64	NACA 0010-64
EXPOSED DATA		
Area		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		
VOID AREA, ft^2 (This area is the void area located at the lower aft portion of the surface).	4.06	0.00005

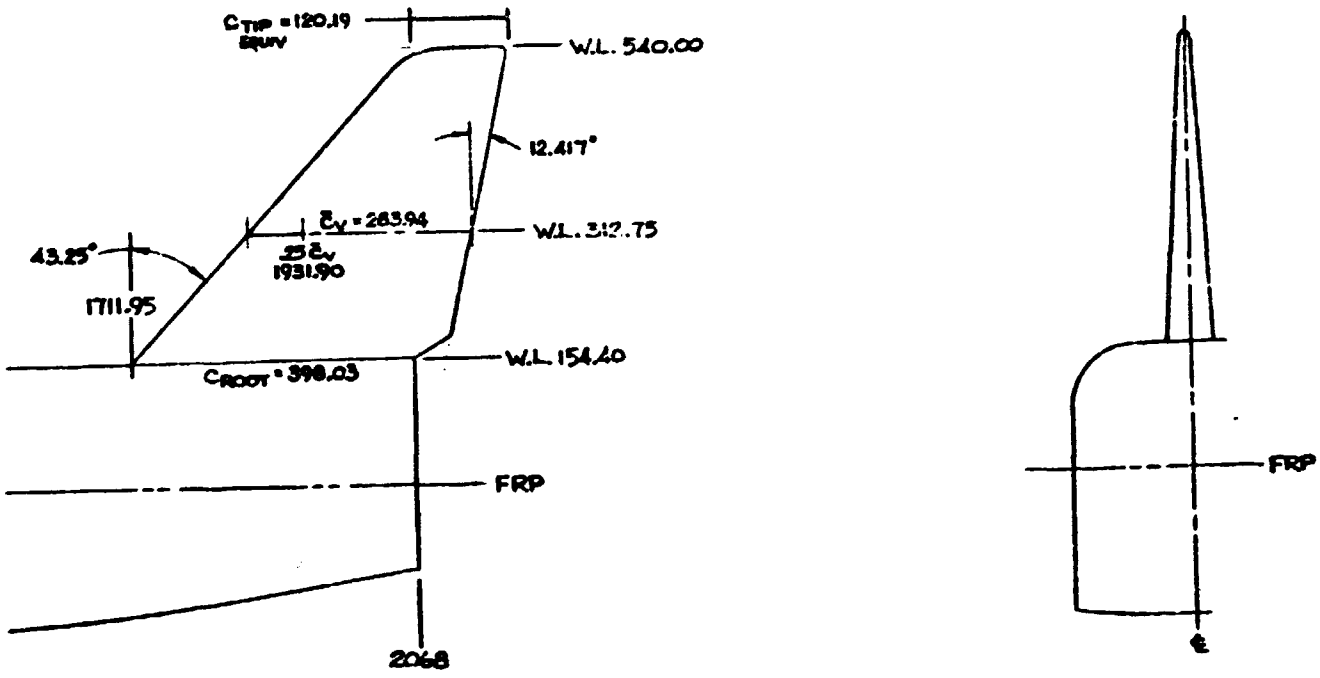


FIGURE 5

VERTICAL STABILIZER V5 9992-130 C CONFIGURATION

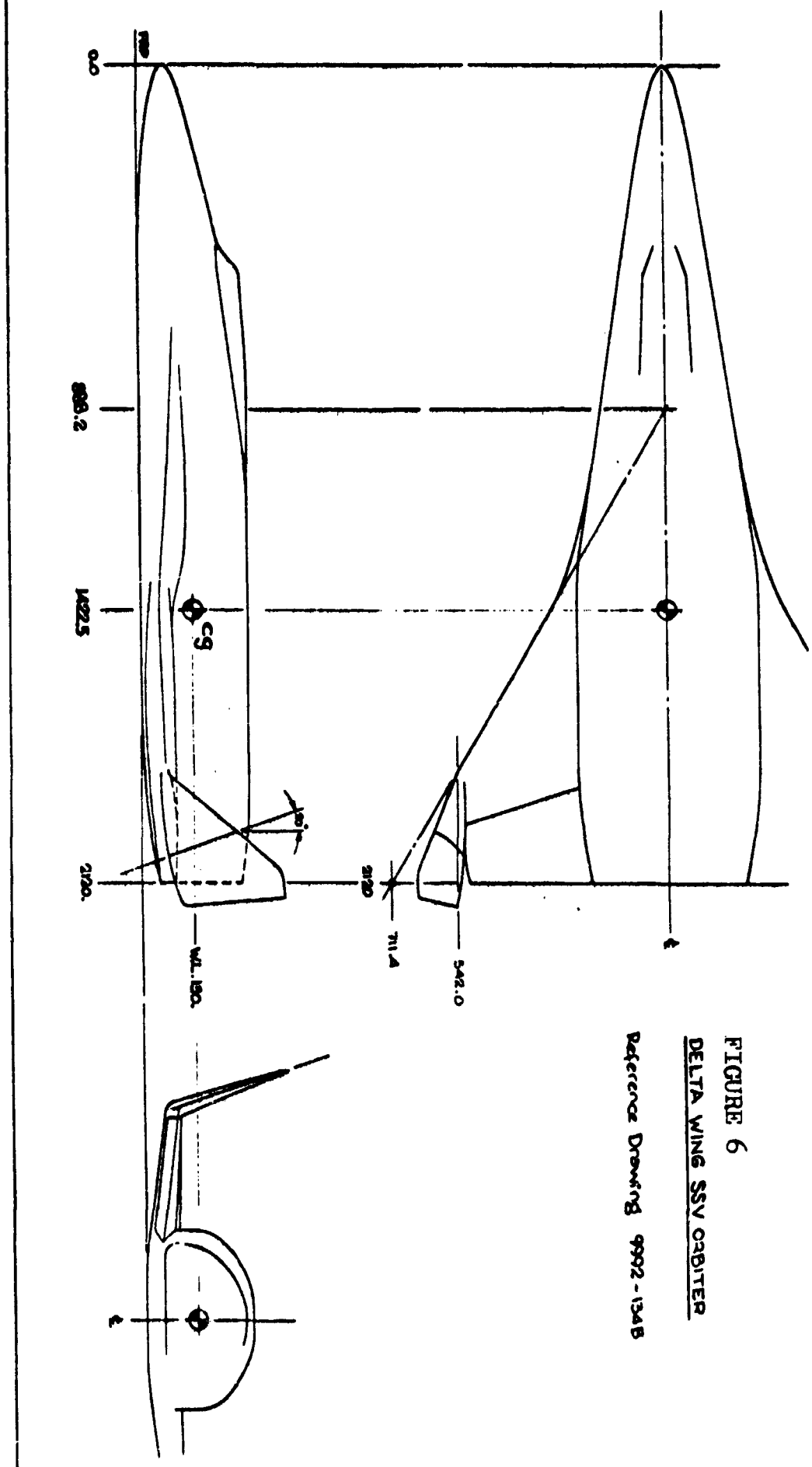


FIGURE 6

DELTA WING SSV ORBITER

Reference Drawing 9992-1348

MODEL COMPONENT: BODY - B_5

GENERAL DESCRIPTION: 9992-134B body. Delta wing orbiter body including a canopy on the upper surface aft of the nose. The model scale factor is 0.0035.

DRAWING NUMBER: Lines Dwg. 9992-134B

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Length , in.	2120.00	7.420
Max. Width, in.	462.86	1.620
Max. Depth, in.	274.29	0.960
Fineness Ratio	5.906	5.906
Area		
Max. Cross-Sectional , ft^2 (Fus. Sta. 1215.0 to 1809.0 in.)	702.75	0.00860
Planform	-	-
Wetted	-	-
Base		

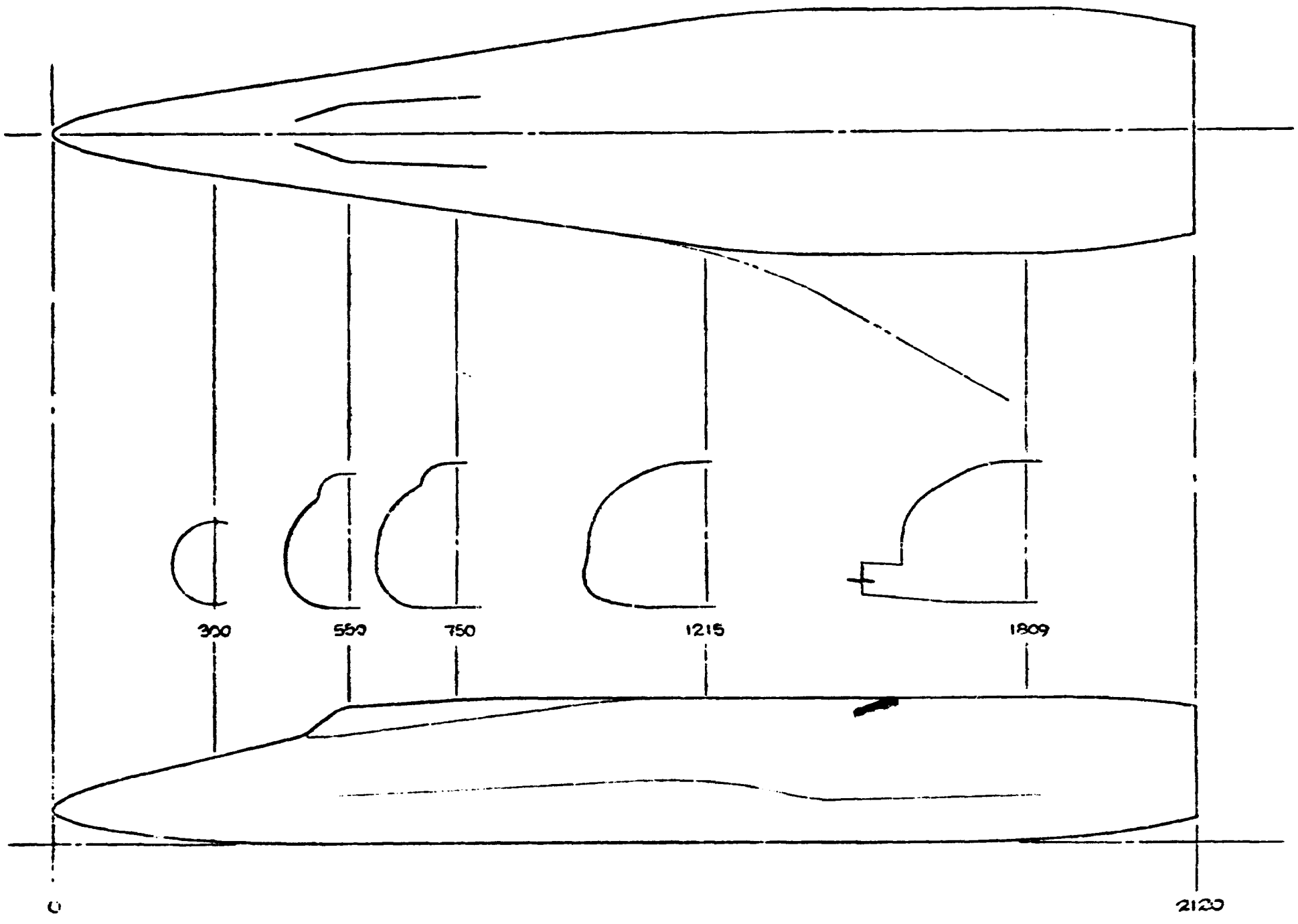


FIGURE 7 BODY B5 9992 - 134B CONFIGURATION

MODEL COMPONENT: WING - W13

GENERAL DESCRIPTION: 9992-134B delta wing located on body B5. The total and exposed data do not include the leading edge cuff data which is listed below. The model factor is 0.0035.

DRAWING NUMBER: Lines Dwg. 9992-134B

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform , ft^2	5740.00	0.070315
Wetted	1084.00	3.794
Span (equivalent), in.	1.411	1.411
Aspect Ratio	1.723	1.723
Rate of Taper	0.237	0.237
Taper Ratio	7.000	7.000
Dihedral Angle, degrees	0.000	0.000
Incidence Angle, degrees		
Aerodynamic Twist, degrees(about T.E.)		
~~Toe-in-Angle~~ Wing Sta. 241.80 in.	0.000	0.000
~~Cant-Angle~~ Wing Sta. 546.07 in.	-5.000	-5.000
Sweep Back Angles, degrees		
Leading Edge	59.870	59.870
Trailing Edge	0.0	0.0
0.25 Element Line	52.266	52.266
Chords:		
Root (Wing Sta. 0.0), in.	1232.91	4.315
Tip, (equivalent)(Wing Sta. 546.07 in), in.	292.03	1.022
MAC (Wing Sta. 216.88 in.), in.	859.22	3.007
Fus. Sta. of .25 MAC , in.	1475.58	5.165
W.P. of .25 MAC, in.	44.11	0.154
B.L. of .25 MAC , in.	215.26	0.753
Airfoil Section		
~~Root~~ (Wing Sta. 241.80 in.)in.	NACA 0009-64	NACA 0009-64
Tip (Wing Sta. 546.07 in)in.	NACA 0012-64	NACA 0012-64
EXPOSED DATA		
Area , ft^2	2389.59	0.02927
Span, (equivalent) , in.	612.33	2.143
Aspect Ratio	1.090	1.090
Taper Ratio	0.355	0.355
Chords		
Root (equiv.)(Wing Sta. 237.61 in.),in	823.51	2.882
Tip(equiv.)(Wing Sta. 546.07 in.),in.	292.03	1.022
MAC(Wing Sta. 367.34 in.),in	599.27	2.100
Fus. Sta. of .25 MAC , in.	1670.02	5.845
W.P. of .25 MAC, in.	62.44	0.219
B.L. of .25 MAC, in.	364.61	1.276
L.E. CUFF DATA		
Area (outb'd of fuselage SL), ft^2	46.49	0.00057
L.E. intersects fuselage SL (Fus.Sta., in	1182.85	4.140
L.E. intersects wing L.E. (Fus.Sta., in	1425.73	4.990

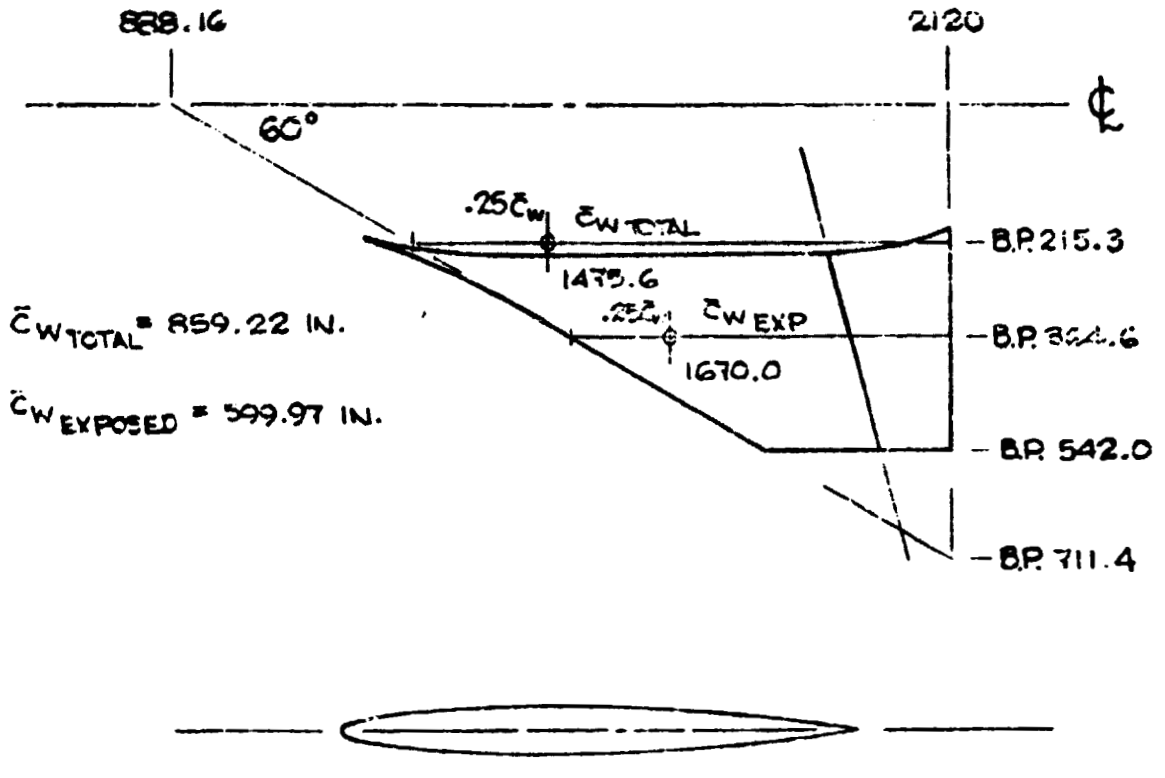


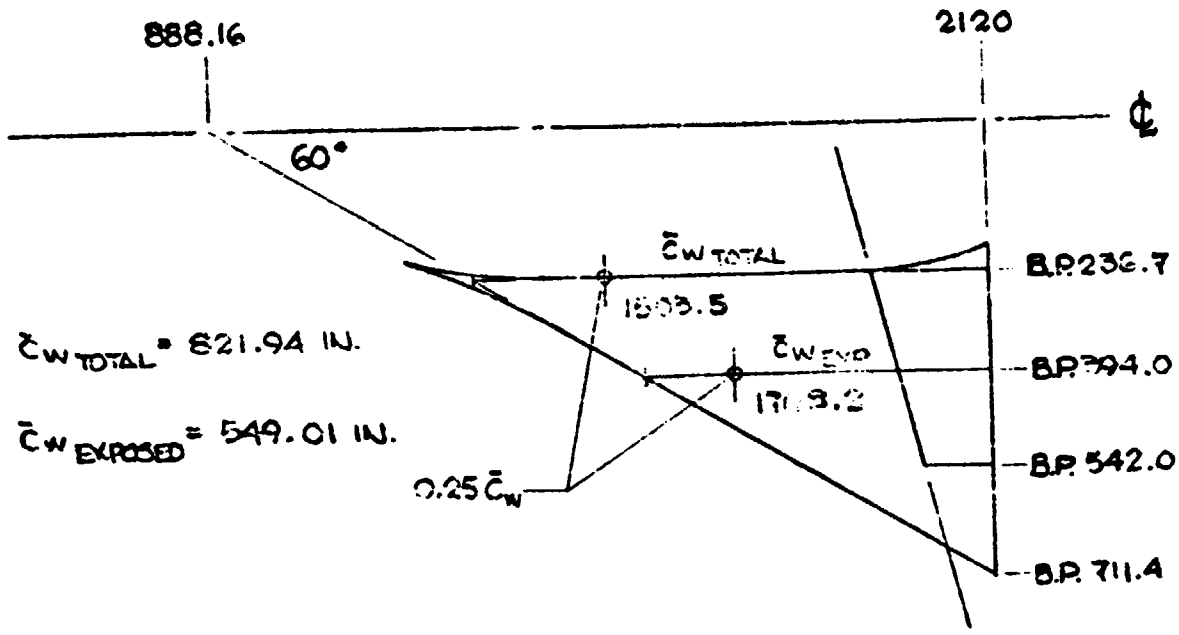
FIGURE 8 TWISTED CLIPPED DELTA WING (W13)

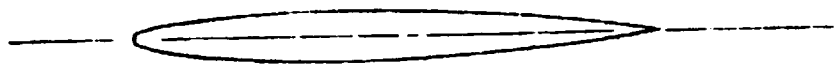
MODEL COMPONENT: WING - W14

GENERAL DESCRIPTION: 9992-134B delta wing which is the same as Wing-W13 except modified to a complete delta (no clipped tip). Used with body B5. The total and exposed data do not include the leading edge cuff data which is listed below. The model factor is 0.0035.

DRAWING NUMBER:

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform, ft^2	6084.00	0.074529
Wetted		
Span (equivalent), in.	1420.44	4.972
Aspect Ratio	2.287	2.287
Rate of Taper	1.723	1.723
Taper Ratio	0.000	0.000
Dihedral Angle, degrees	7.000	7.000
Incidence Angle, degrees	0.000	0.000
Aerodynamic Twist, degrees, about T.E.		
~~Toe-in Angle~~ (Wing Sta. 241.80 in.	0.000	0.000
~~Cant Angle~~ (Wing Sta. 546.07 in.	-5.000	-5.000
Sweep Back Angles, degrees		
Leading Edge	59.870	59.870
Trailing Edge	0.000	0.000
0.25 Element Line	52.266	52.266
Chords:		
Root (Wing Sta. 0.0), in.	1232.91	4.315
Tip, (equivalent)(Wing Sta. 715.55in)in	0.000	0.000
MAC, (Wing Sta. 238.52 in.), in.	821.94	2.877
Fus. Sta. of .25 MAC, in.	1503.54	5.262
W.P. of .25 MAC, in.	46.74	0.164
B.L. of .25 MAC, in.	236.74	0.829
Airfoil Section		
~~Root~~ Wing Sta. 241.80 in.	NACA 0009-64	NACA 0009-64
~~Tip~~ Wing Sta. 546.07 in.	NACA 0012-64	NACA 0012-64
EXPOSED DATA		
Area, ft^2	2733.29	0.03348
Span, (equivalent), in.	948.77	3.321
Aspect Ratio	2.287	2.287
Taper Ratio	0.000	0.000
Chords		
Root(equiv.)(Wing Sta. 237.61 in),in.	823.51	2.882
Tip (equiv.)(Wing Sta. 715.55 in),in.	0.000	0.000
MAC (Wing Sta. 396.92 in.),in.	549.01	1.922
Fus. Sta. of .25 MAC, in	1708.24	5.979
W.P. of .25 MAC, in.	66.05	0.231
B.L. of .25 MAC, in.	393.96	1.379
21 **LEADING EDGE CUFF DATA**		
Area (cuffed of Fuselage IL), ft^2	46.49	0.00057
L.E. intersects fuselage IL (Fus.Sta., in.	1182.26	4.140
L.E. intersects wing L.E. @ Fus. Sta., in.	1425.73	4.990





CHORD (B.P. 240.0)

0009-64 SERIES AIRFOIL

TIP CHORD (B.P. 542.0)

0012-64 SERIES AIRFOIL

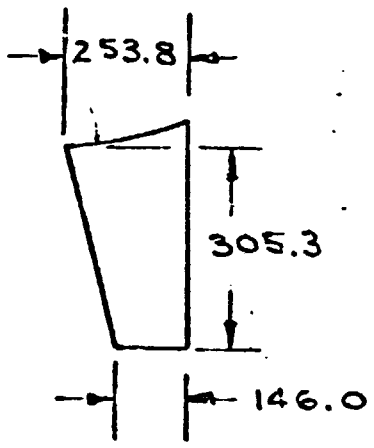
FIGURE 9 TWISTED DELTA WING (W14)

MODEL COMPONENT: ELEVON - E2 (data for one of two)

GENERAL DESCRIPTION: Elevon used with the 9992-134B delta wing (Wing-W13)
The model scale factor is 0.0035.

DRAWING NUMBER: Lines Dwg. 9992-134B

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area , ft^2	464.60	0.00569
Span (equivalent) , in.	334.68	1.171
Inb'd equivalent chord (WingSta.211.39in.)	253.79	0.888
Outb'd equivalent chord(WingSta.546.07in.)	146.01	0.511
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	0.292	0.292
At Outb'd equiv. chord	0.500	0.500
Sweep Back Angles, degrees		
Leading Edge (Hinge Line)	17.851	17.851
Tailing Edge	0.000	0.000
Hingeline	17.851	17.851
Area Moment (Normal to hinge line) ft^3	8025.69	0.00034



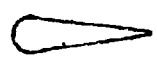


FIGURE 10

ELEVON, E_2 - Elevon Used With Wing-W_{13}

MODEL COMPONENT: ELEVON - E3 (data for one of two)

GENERAL DESCRIPTION: Elevon used with the 9992-134B complete delta (no clipped tip) wing (Wing - W14).

The model scale factor is 0.0035.

DRAWING NUMBER:

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area, ft^2	464.60	0.00569
Span (equivalent), in.	334.68	1.171
Inb'd equivalent chord (WingSta. 211.39in) in	253.79	0.888
Outb'd equivalent chord (WingSta. 546.07in) in	146.01	0.511
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	0.292	0.292
At Outb'd equiv. chord	0.500	0.500
Sweep Back Angles, degrees		
Leading Edge (Hingeline)	17.851	17.851
Tailing Edge	0.000	0.000
Hingeline	17.851	17.851
Area Moment (Normal to hinge line), ft^3	8025.69	0.00034

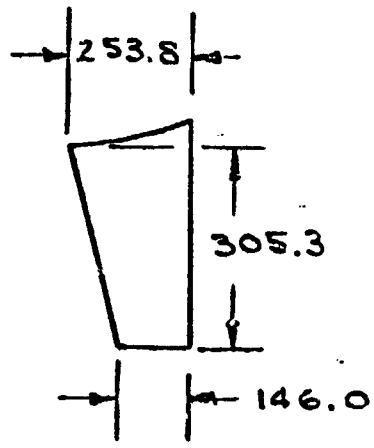


FIGURE 11

ELEVON, E_3 - Elevon Used With Wing - W_{14}

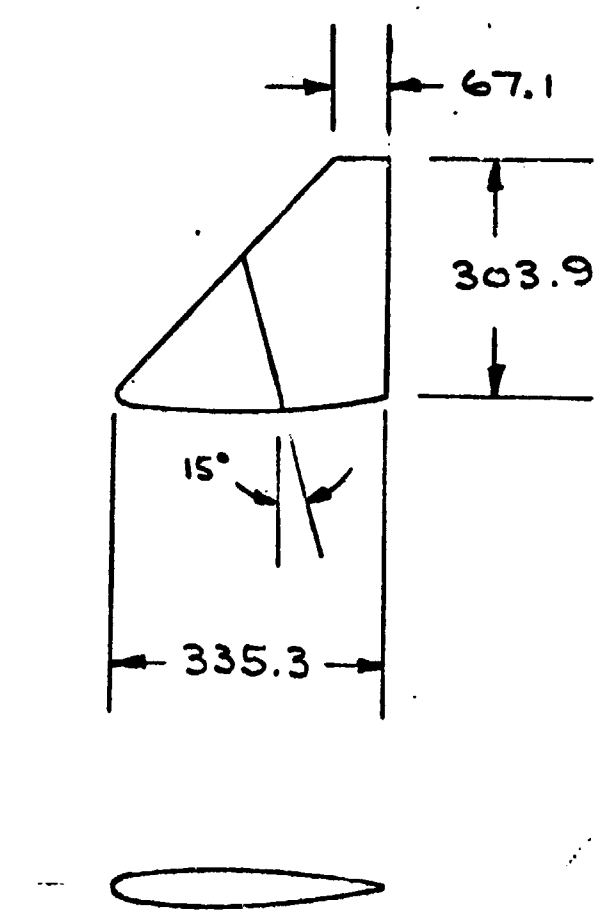
MODEL COMPONENT: VERTICAL STABILIZER - V14 (data for one of two)

GENERAL DESCRIPTION: Vertical stabilizer fins located on the outboard tip of the 9992-134B delta wing. (W13)

The model scale factor is 0.0035

DRAWING NUMBER: Lines Dwg. 9992-134B

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform, ft^2	424.64	0.00520
Wetted		
Span (equivalent), in.	303.95	1.064
Aspect Ratio	1.511	1.511
Rate of Taper	0.882	0.882
Taper Ratio	0.200	0.200
Dihedral Angle, degrees	-	-
Incidence Angle, degrees	-	-
Aerodynamic Twist, degrees	-	-
Toe-In Angle, degrees	-1.817	-1.817
Cant Angle (Tip Outb'd), degrees	20.000	20.000
Sweep Back Angles, degrees		
Leading Edge	38.897	38.897
Trailing Edge	-4.701	-4.701
0.25 Element Line	30.240	30.240
Chords: equivalent		
Root (~~Wing Sta. 0.0~~ W.P. 74.58 in) in.	335.25	1.173
Tip, (equivalent W.P. 360.32 in.) in.	67.11	0.235
MAC (W.P. 185.71 in.), in.	230.96	0.808
Fus. Sta. of .25 MAC, in.	1997.95	6.993
W.P. of 25 MAC, in.	185.71	0.650
B.L. of .25 MAC, in.	582.67	2.039
Airfoil Section (measured parallel to		
~~Root~~ the chord line at the tip)	NACA 0012-64	NACA 0012-64
~~Tip~~		
EXPOSED DATA		
Area		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		



0012-64 SERIES AIRFOIL

FIGURE 12

VERTICAL STABILIZER V_{14} 9992-134B CONFIGURATION

MODEL COMPONENT: RUDDER - R4

GENERAL DESCRIPTION: Rudder used with the 9992-134B delta wing orbiter vertical stabilizer V14.

The model scale factor is 0.0035.

DRAWING NUMBER: Lines Dwg. 9992-134B

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area, ft^2	288.95	0.00354
Span (equivalent), in.	294.27	1.030
Inb'd equivalent chord (W.P. 83.67 in), in.	133.53	0.467
Outb'd equivalent chord (W.P. 360.32 in), in.	67.11	0.235
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	0.409	0.409
At Outb'd equiv. chord	1.000	1.000
Sweep Back Angles, degrees		
Leading Edge	38.897	38.897
Tailing Edge	-4.701	-4.701
Hingeline	-18.833	-18.833
Area Moment (Normal to hinge line), ft^3	3836.90	0.00016

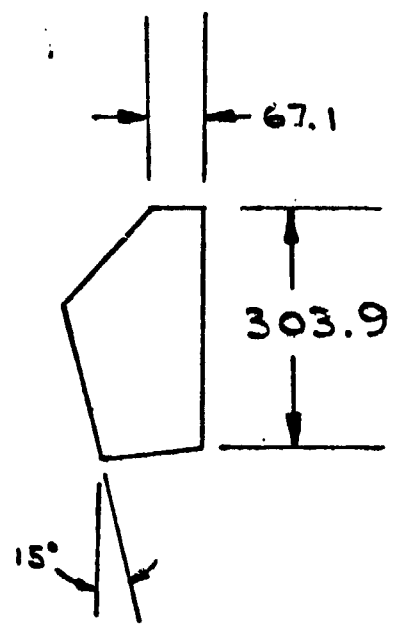


FIGURE 13
RUDDER - R_4

MODEL COMPONENT: Vertical Stabilizer - V_{16}

GENERAL DESCRIPTION: Centerline vertical stabilizer with the basic trailing edge. Used with delta wing orbiter body B5 (configuration 9992-134B).

The model scale factor is 0.0035.

DRAWING NUMBER: S-867-47, -49

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform, ft^2	663.63	0.00813
Theoretical Span, in.	380.421	
Span (equivalent), in.	372.61	1.304
Aspect Ratio	1.453	1.453
Rate of Taper	0.718	0.718
Taper Ratio	0.314	0.314
Dihedral Angle, degrees	-	-
Incidence Angle, degrees	-	-
Aerodynamic Twist, degrees	-	-
Toe-In Angle, degrees	0.0	0.0
Cant Angle, degrees	0.0	0.0
Sweep Back Angles, degrees		
Leading Edge	45.0	45.0
Trailing Edge	15.734	15.734
0.25 Element Line	39.367	39.367
Chords: Theoretical Tip, in.	117.053	
Root (Theoretical) W.P. 274.29 in	390.29	1.366
Tip, (equivalent), (W.P. 646.90 in), in	122.65	0.429
MAC (W.P. 428.19 in), in	279.74	0.979
Fus. Sta. of .25 MAC, in	2032.98	7.115
W.P. of .25 MAC, in	428.19	1.499
B.L. of .25 MAC, in	0.0	0.0
Airfoil Section, 0-60-100 Diamond (modified)		
L.E. Radius, in. (1.6% chord)	6.29	0.022
T.E. Radius, in (1.0% chord)	4.00	0.014
EXPOSED DATA		
Area		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

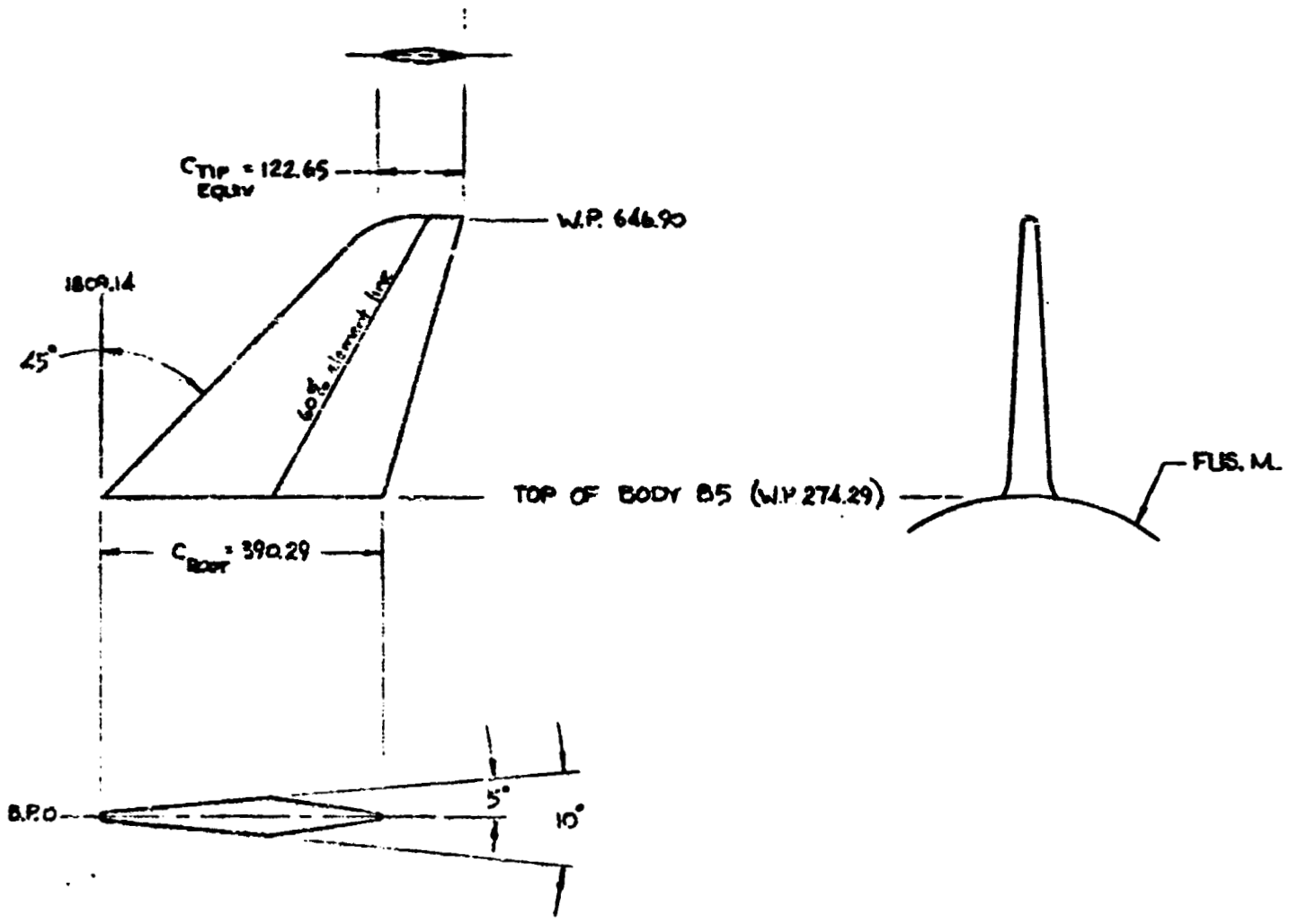


FIGURE 14
VERTICAL STABILIZER V16

MODEL COMPONENT: Vertical Stabilizer - V 17

GENERAL DESCRIPTION: Centerline vertical stabilizer with the 5° (half angle) wedge trailing edge. Used with delta wing orbiter body B5 (configuration 9992-134B).

The model scale factor is 0.0035.

DRAWING NUMBER: S-867-47, -50

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform, ft^2	663.63	0.00813
Theoretical Span, in.	380.421	
Span (equivalent), in.	372.61	1.304
Aspect Ratio	1.453	1.453
Rate of Taper	0.718	0.718
Taper Ratio	0.314	0.314
Dihedral Angle, degrees	-	-
Incidence Angle, degrees	-	-
Aerodynamic Twist, degrees	-	-
Toe-In Angle, degrees	0.0	0.0
Cant Angle, degrees	0.0	0.0
Sweep Back Angles, degrees		
Leading Edge	45.0	45.0
Trailing Edge	15.734	15.734
0.25 Element Line	39.367	39.367
Chords: Theoretical Tip, in.	117.053	
Root (W.P. 274.29 in	390.29	1.366
Tip, (equivalent), (W.P. 646.90 in), in	122.65	0.429
MAC (W.P. 428.19 in), in	279.74	0.979
Fus. Sta. of .25 MAC, in	2032.98	7.115
W.P. of .25 MAC, in	428.19	1.499
B.L. of .25 MAC, in	0.0	0.0
Airfoil Section, Wedge shape with L.E.R. and Flat T.E.		
L.E. Radius, in. (1.6% chord)	6.29	0.022
EXPOSED DATA		
Area		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

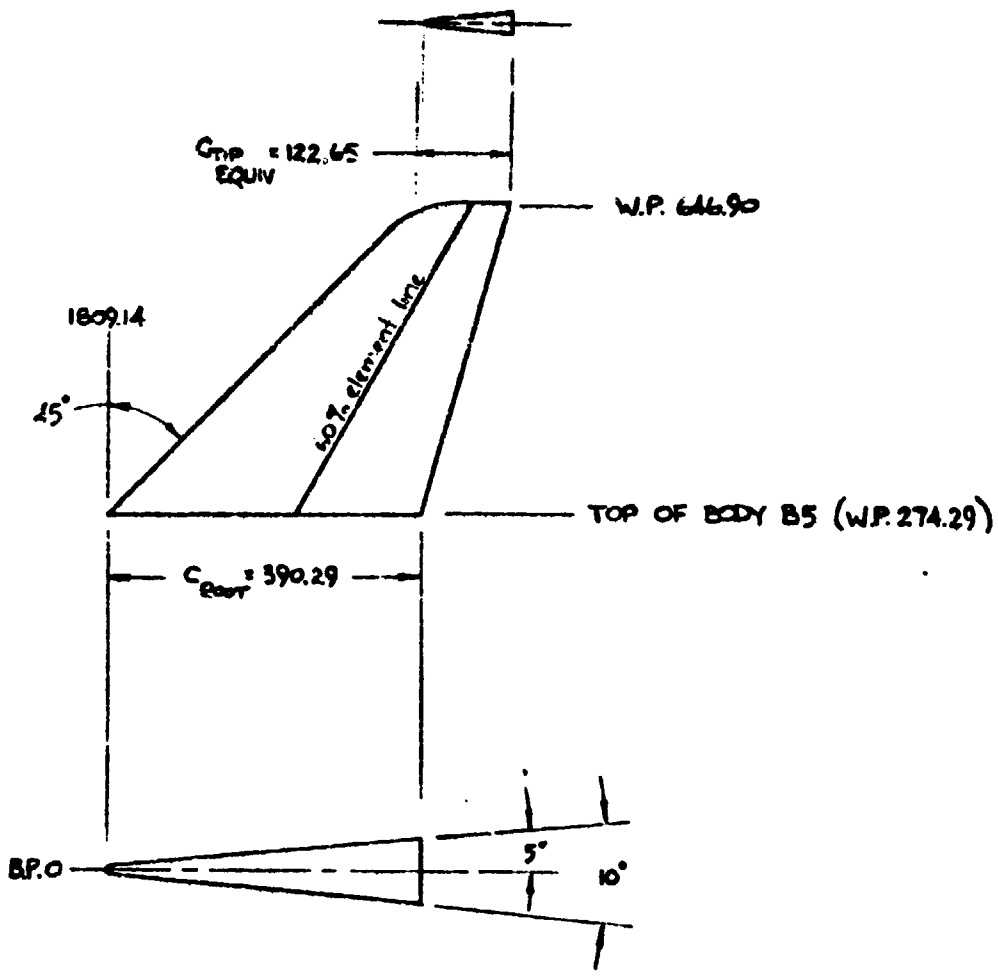


FIGURE 15
VERTICAL STABILIZER V17

MODEL COMPONENT: Vertical Stabilizer - V_{18}

GENERAL DESCRIPTION: Centerline vertical stabilizer with the 20° (half angle) wedge trailing edge. Used with delta wing orbiter body B_5 (Configuration 9992-134B).

The model scale factor is 0.0035.

DRAWING NUMBER: S-867 47, -51

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform, ft^2	663.63	0.00813
Theoretical Span, in.	380.421	
Span (equivalent), in.	372.61	1.304
Aspect Ratio	1.453	1.453
Rate of Taper	0.718	0.718
Taper Ratio	0.314	0.314
Dihedral Angle, degrees	-	-
Incidence Angle, degrees	-	-
Aerodynamic Twist, degrees	-	-
Toe-In Angle, degrees	0.0	0.0
Cant Angle, degrees	0.0	0.0
Sweep Back Angles, degrees		
Leading Edge	45.0	45.0
Trailing Edge	15.734	15.734
0.25 Element Line	39.367	39.367
Chords: Theoretical Tip, in.	117.053	
Root (W.P. 274.29 in	390.29	1.366
Tip, (equivalent), (W.P. 646.90 in), in	122.65	0.429
MAC (W.P. 428.19 in), in	279.74	0.979
Fus. Sta. of .25 MAC, in	2032.98	7.115
W.P. of .25 MAC, in	428.19	1.499
B.L. of .25 MAC, in	0.0	0.0
Airfoil Section, Double wedge shape with 10° included angle (0% to 60% element line) and 40° included angle (60% to 100% element line); and flat T.E..		
L.E. Radius, in. (1.6% chord)	6.29	0.022
Area		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

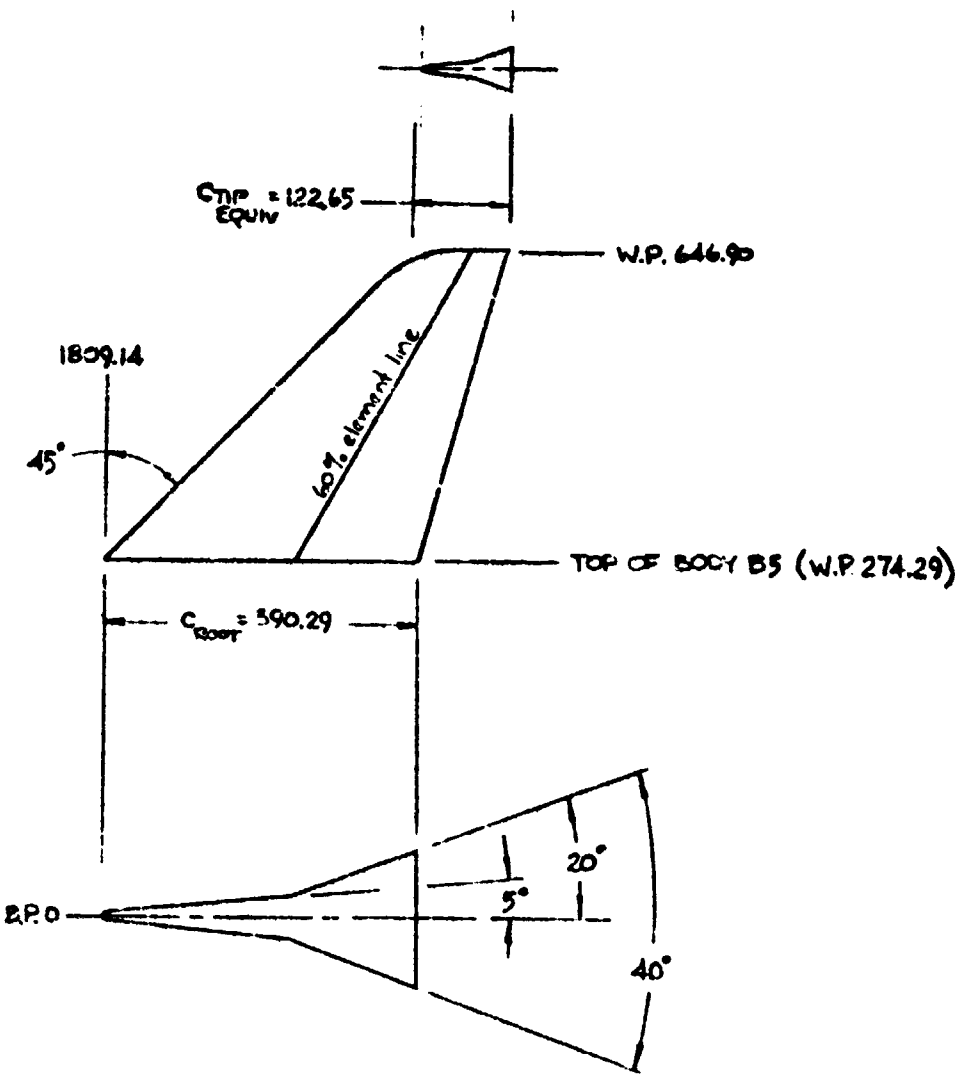


FIGURE 16
VERTICAL STABILIZER VIE

MODEL COMPONENT: Vertical Stabilizer - V_{19}

GENERAL DESCRIPTION: Centerline vertical stabilizer with the 35° (half angle) wedge trailing edge. Used with delta wing orbiter body B_5 (configuration 9992-134B).

The model scale factor is 0.0035.

DRAWING NUMBER: S-867-47, -52

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform, ft^2	663.63	0.00813
Theoretical Span, in.	380.421	
Span (equivalent), in.	372.61	1.304
Aspect Ratio	1.453	1.453
Rate of Taper	0.718	0.718
Taper Ratio	0.314	0.314
Diehedral Angle, degrees	-	-
Incidence Angle, degrees	-	-
Aerodynamic Twist, degrees	-	-
Toe-In Angle, degrees	0.0	0.0
Cant Angle, degrees	0.0	0.0
Sweep Back Angles, degrees		
Leading Edge	45.0	45.0
Trailing Edge	15.734	15.734
0.25 Element Line	39.367	39.367
Chords: Theoretical Tip, in.	117.053	
Root (W.P. 274.29 in	390.29	1.366
Tip, (equivalent), (W.P. 646.90 in), in	122.65	0.429
MAC (W.P. 428.19 in), in	279.74	0.979
Fus. Sta. of .25 MAC, in	2032.98	7.115
W.P. of .25 MAC, in	428.19	1.499
B.L. of .25 MAC, in	0.0	0.0
Airfoil Section, Double wedge shape with 10° included angle (0% to 60% element line) and 70° included angle (60% to 100% element line); and flat T.E..		
L.E. Radius, in. (1.6% chord)	6.29	0.022
Area		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

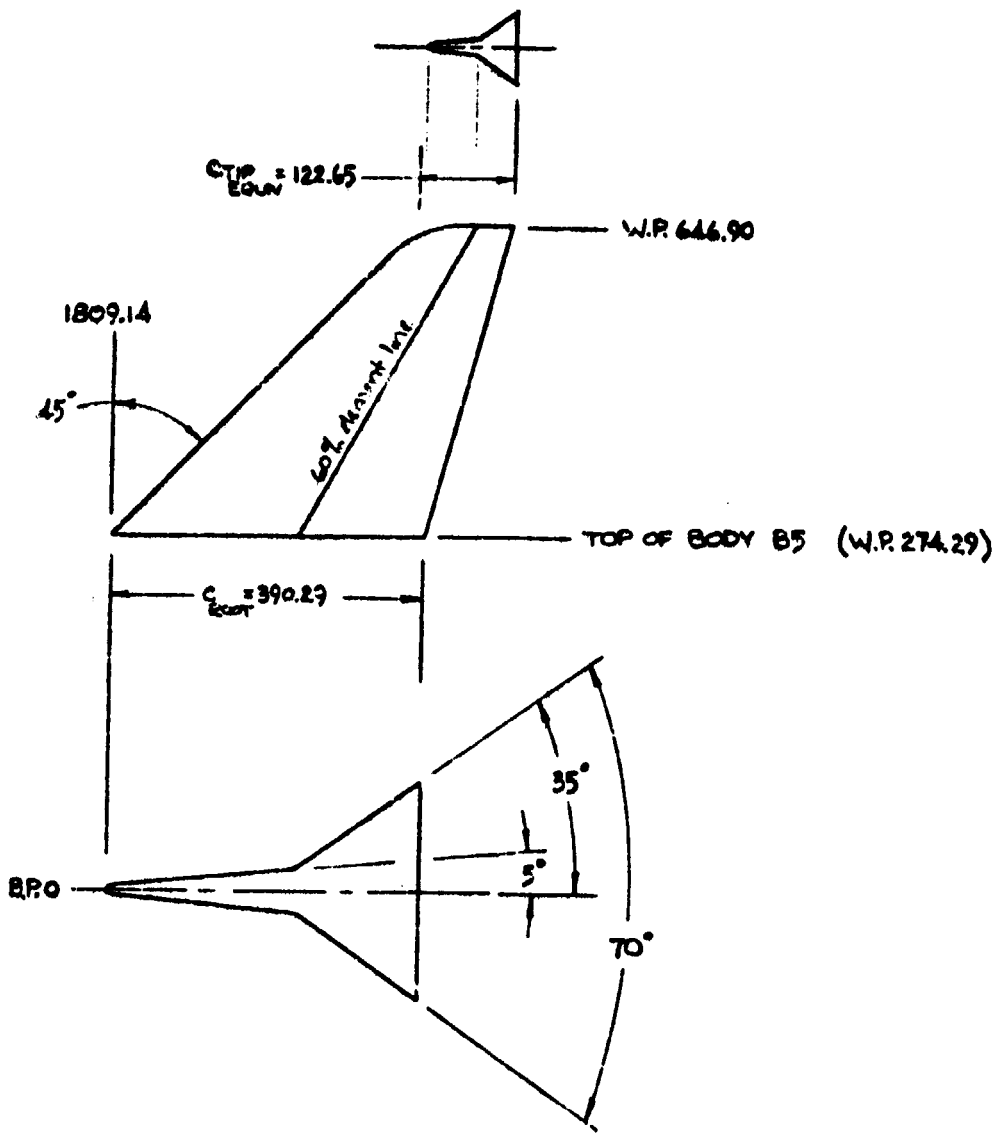


FIGURE 17
VERTICAL STABILIZER V19

TEST TWT-468 DAT. SET COLLATION SHEET

Force - Delta Wing Orbiter, 0.0035-Scale, Stability and Control

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_E	δ_R	δ_A	δ_V	NO. of RUNS	MACH NUMBERS 0.6	0.9	1.2	1.46	1.96	2.99	4.96
B2101A	B5	A	0					1							006/0
01D	↓	D	↓					1							104/0
01E	↓	E	↓					1							147/0
02A	B5W13E2	A		0		0		1							009/0
02D	↓	D		↓		↓		1							110/0
02E	↓	E		↓		↓		1							143/0
03A	B5W14E3	A		↓		↓		1							008/0
03D	↓	D		↓		↓		1							107/0
03E	↓	E		↓		↓		1							146/0
35A	B5W13E2V14R4X	A		↓	0	↓	0	2	236/0	237/0					
35D	↓	D		↓	↓	↓	↓	3	221/0	220/0				247/0	
04A	B5W13E2V14R4	A		↓	↓	↓	↓	5			176/0	185/0	186/0	023/0	022/0
04D	↓	D		↓	↓	↓	↓	5			173/0	172/0	162/0	114/0	113/0
04E	↓	E		↓	↓	↓	↓	3					157/0	140/0	139/0
05A	↓	A		15	↓	↓	↓	1							024/0
05D	↓	D		↓	↓	↓	↓	1							117/0
05E	↓	E		↓	↓	↓	↓	1							136/0
06A	↓	A		-7.5	↓	↓	↓	1							025/0
06D	↓	D		↓	↓	↓	↓	1							120/0
06E	↓	E	↓	↓	↓	↓	↓	1							133/0

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM | CL | CLN | CY | CSL | CAB | CDF | L/D | XCP | 9

IDPVAR(1) | IDPVAR(2) | NDV

COEFFICIENTS: α or β SCHEDULES

α_A = 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

α_D = 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

α_E = 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60

TEST TWT-468 DAT. SET COLLATION SHEET

Force-Delta Wing Orbiter, 0.0035-Scale. Stability and Control

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_E	δ_R	δ_A	δ_V	NO. of RUNS	MACH NUMBERS 0.6	0.9	1.2	1.46	1.96	2.99	4.96
R2107A	BSW13E2V14R4	A	0	-15	0	0	0	1							026/0
07D		D		↓	↓	↓	↓	1							123/0
07E		E						1							130/0
08A		A		-30				1							027/0
08D		D		↓				1							124/0
08E		E						1							129/0
10A		A		-45				1							028/0
10D		D		↓				1							125/0
10E		E						1							128/0
11A		A		0		-15		1							029/0
11D		D		↓		↓		1							126/0
11E		E	↓	↓	↓	↓	↓	1							127/0
01M	B5	0	A					1							054/0
01N		15						1							056/0
01Φ		30						1							086/0
01P		45						1							087/0
02M	BSW13E2	0		0		0		1							053/0
02N		15						1							059/0
02Φ		30						1							079/0
02P		45	↓	↓		↓		1							078/0

1 7 13 19 25 31 37 43 49 55 61 67 75 76

ICLM	ICL	ICLN	ICY	ICSL	ICAB	ICDF	IL/D	IXCP			9
									IDPVAR(1)	IDPVAR(2)	NDV

COEFFICIENTS: α or β SCHEDULES

αA = 0,2,4,6,8,10,12,10,16,18,20

αD = 20,22,24,26,28,30,32,34,36,38,40

αE = 40,42,44,46,48,50,52,54,56,58,60

βA = -4,-2,0,2,4,6,8,10

δ_A=-15 = δ_E -15L, +15R

TEST TWT-468 DAT. SET COLLATION SHEET

Force - Delta Wing Orbiter, 0.0035-Scale. Stability and Control

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_E	δ_R	δ_A	δ_V	NO. of RUNS	MACH NUMBERS 0.6	0.9	1.2	1.46	1.96	2.99	4.96
R21 03M	B5W14E3	0	A	0	.	0		1							046/0
03N	↓	15		↓		↓		1							056/0
03Φ		30						1							080/0
03P		45						1							081/0
38M	B5W13E2V14R4X	0			0		0	2	248/0	249/0					
38N	↓	15			↓		↓	2	239/0	238/0					
38Φ		30						2	215/0	214/0					
38P		45						2	212/0	213/0					
04M	B5W13E2V14R4	0						5			177/0	184/0	187/0	083/0	032/0
04N	↓	15						5			180/0	181/0	190/0	061/0	060/0
04Φ		30						5			174/0	171/0	168/0	075/0	074/0
04P		45				↓		5			175/0	170/0	169/0	077/0	076/0
12M		0				.10		1							036/0
12N		15				↓		1							062/0
12Φ		30						1							073/0
12P		45						1							072/0
13M		0				20		1							039/0
13N		15				↓		1							063/0
13Φ		30						1							070/0
13P	↓	45	↓	↓	↓	↓	↓	1							071/0

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM	ICL	ICLN	ICY	ICSL	KAB	KDF	IL/D	KCP			
								9	IDPVAR(1)	IDPVAR(2)	NDV

COEFFICIENTS: (3) A = -4, -2, 0, 2, 4, 6, 8, 12

α or β SCHEDULES

δ_V ~ T.E. outb'd, both R4's

TEST TWT-468 DAT. SET COLLATION SHEET

Force-Delta Wing Orbiter, 0.0035-Scale. Stability and Control

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_E	δ_R	δ_A	δ_V	NO. of RUNS	MACH NUMBERS 0.6	0.9	1.2	1.46	1.96	2.99	4.96
R21 14M	BSW13E2V14R4	0	A	0	-10	0	0	1							042/0
14N		15						1							064/0
14Φ		30						1							069/0
14P		45						1							068/0
15M		0			-20			1							043/0
15N		15						1							065/0
15Φ		30						1							066/0
15P		45						1							067/0
28M	BSW14E3V16X	0						1	245/0						
28N		15						1	240/0						
28Φ		30						1	214/0						
28P		45						1	211/0						
29M	BSW14E3V17	0						5			176/0	183/0	188/0	045/0	044/0
29N		15						5			179/0	182/0	189/1	058/0	057/0
36M	BSW14E3V17X	0						2	244/0	243/0					
36N		15						2	241/0	242/0					
36Φ		30						7	217/1	218/0	219/0	206/0	209/0	205/0	204/0
36P		45						7	210/0	209/1	208/0	207/0	201/0	203/0	202/0

1 7 13 19 25 31 37 43 49 55 61 67 75 76

K,M . . ICL . . . ICLN . . ICY . . . ICSL . . ICAB . . K,D,F . . IL/B . . KCP 9

IDPVAR(1) | IDPVAR(2) | NDV

COEFFICIENTS: β_A = -4, -2, 0, 2, 4, 6, 8, 10

α or β SCHEDULES

δ_R ~ (-) TE right (both)

TEST TWT-469 DAT. SET COLLATION SHEET

Force - Straight wing Orbiter, 0.035 Scale. Stab. [illegible] and Control

☐ PRETEST
■ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_H	NO. of RUNS	MACH NUMBERS 0.6	0.9	1.2	1.46	1.96	2.99	4.96
R21 17A	B6	A	0		3					191/0	003/0	004/0
17D	↓	D			3					160/0	122/0	121/0
17E	↓	E			3					169/0	132/0	131/0
18A	B6W10	A			3					192/0	002/0	001/0
18D	↓	D			3					161/0	119/0	118/0
18E	↓	E			3					158/0	135/0	134/0
19A	B6W10H12	A		0	3					193/0	008/0	007/0
19D	↓	D		↓	3					163/0	103/0	102/0
19E	↓	E		↓	3					156/0	135/0	134/0
20A	B6W10H12VS	A		↓	3					194/0	011/0	010/0
21A	↓	A		10	3					195/0	013/0	012/0
37D	B6W10H12X	D		↓	2	222/0	223/0					
30D	B6W10H12	D		↓	3					164/0	106/0	105/0
22A	B6W10H12VS	A		-10	3					196/0	015/0	014/0
23A	↓	A		-20	3					197/0	017/0	016/0
41D	B6W10H12X	D		↓	2	225/0	224/0					
31D	B6W10H12	D		↓	3					165/0	109/0	108/0
31E	↓	E		↓	2						145/0	144/0
24A	B6W10H12VS	A		-30	3					198/0	021/0	020/0
42D	B6W10H12X	D	↓	↓	2	226/0	227/0					

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM ICL KLN KY ICSL CAP CDF IL/D XCP | 9

→ IDPVAR(1) | IDPVAR(2) | NDV

COEFFICIENTS: α or β SCHEDULES

αA = 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

αD = 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

αE = 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60

TEST TWT-468 DAT. SET COLLATION SHEET

Force - Straight Wing Orbiter, 0.0035-Scale. Stability and Control

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_H	CONTROL DEFLECTION δ_A	NO. of RUNS	MACH NUMBERS 0.6	0.9	1.2	1.46	1.96	2.99	4.96
R21 32D	B6W10H12	D	0	-30		3					166/0	112/0	111/0
32E	↓	E		↓		2						142/0	141/0
25A	B6W10H12 VS	A		-40		3					199/0	019/0	018/0
43D	B6W10H12X	D				2	229/0	228/0					
33D	B6W10H12	D				3					167/0	116/0	115/0
33E		E				2						138/0	137/0
26E				-50		2						149/0	148/0
27E				20		2						151/0	150/0
34E	↓	↓	↓	-35	-15	2						153/0	152/0
17U	B6	0	A			2						035/0	034/0
17T	B6	60	A			2						101/0	100/0
18U	B6W10	0	↓			2						031/0	030/0
18R	↓	10	↓			2						048/0	047/0
18T	B6W10	60	A			2						095/0	094/0
19U	B6W10H12	0	↓	0		2						038/0	037/0
19R	↓	10	↓	↓		2						050/0	049/0
19T	B6W10H12	60	A	0		2						093/0	092/0

44

1 7 13 19 25 31 37 43 49 55 61 67 75 76

C.L.M	ICL	KLN	KY	KSL	CAB	CDF	L/D	KCP			9
									IDPVAR(1)	IDPVAR(2)	NDV

COEFFICIENTS: α or β SCHEDULES

α_A = 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

α_D = 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

α_E = 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60

β_A = -4, -2, 0, 2, 4, 6, 8, 10

δ_H = -20R, -50L = [δ_H = -35, δ_A = -15]

TEST TWT-463 DATA SET COLLATION SHEET

Force- Straight Wing Orbiter, 0.0035-Scale. Stability and Control

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_N	CONTROL DEFLECTION δ_H			NO. of RUNS	MACH NUMBERS 0.6	0.9	1.2	1.46	1.96	2.99	4.96					
R2120U	B6W10H12V5	0	A		0			2						041/0	040/0					
20R	↓	10	↓		↓			2						052/0	051/0					
44S	B6W10H12V5K	20	↓		↓			2						089/0	088/0					
39A	B6X	A	0	MAX				1	235/0											
39D	↓	D	↓	↓				1	231/0											
39E		E						1	233/0											
40A		A		MIN				1	234/0											
40D		D		↓				1	230/0											
40E	↓	E	↓	↓				1	232/0											

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM | CL | CD-N | CY | CRL | CAB | CDF | L/D | XCP | 9

COEFFICIENTS: IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

αA = 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

αD = 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

αE = 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60

βA = -4, -2, 0, 2, 4, 6, 8, 10

TEST TWT-468 DAT. SET DESCRIPTOR SHEET

Force-Delta Wing Orbiter, 0.0035-Scale, Stability and Control

DATA SET IDENTIFIER	DATA SET DESCRIPTOR (1 / 11 / 21 / 31 / 41)	Mode Type	CURVE SLOPE RANGE 51 LOWER LIMIT	61 UPPER LIMIT
R2101A	M.S.F.C.468 NSI DELTA ORBITER IBS	1 1	0.0	10.0
01D				
01E				
02A	IBSW13E2		0.0	10.0
02D				
02E				
03A	IBSW14E3		0.0	10.0
03D				
03E				
35A	IBSW13E2V14R4X		0.0	10.0
35D				
04A	IBSW13E2V14E4		0.0	10.0
04D				
04E				
05A	E14.5.0		0.0	10.0
05D				
05E				
06A	E-7.5		0.0	10.0
06D				
06E				

1 SREF(1)	11 SREF(2)	21 LREF(1)	31 LREF(2)	41 BREF(1)	51 BREF(2)	61 YMRP(1)	71 XMPP(2)
10.732	150 INCHES	12.874	INCHES	19.980	INCHES	14.979	INCHES

YMRP(1)	YMRP(2)	ZMRP(1)	ZMRP(2)	SCALE(1)	SCALE(2)	FILREF
0.0 INCHES		10.455 INCHES		0.0035	SCALE	NA 70 446

TEST TWT-468 DAT SET DESCRIPTOR SHEET

Force-Delta Wing Orbiter, 0.0035-Scale. Stability and Control

DATA SET IDENTIFIER	DATA SET DESCRIPTOR (1 / 11 / 21 / 31 / 41)	Mode	Plot	CURVE SLOPE RANGE 51 LOWER LIMIT	61 UPPER LIMIT
221 07A	MSFC468 NSI DELTA ORBITER B5W13E2V14R4 EP15.01	1	1	0.0	10.0
07D					
07E					
08A	EP30.9			0.0	10.0
08D					
08E					
10A	EP45.01			0.0	10.0
10D					
10E					
11A	AI-15,41,58			0.0	15.0
11D					
11E					
01M	B5	2	1	-2.5	2.5
01N					
01Φ					
01P					
02M	B5W13E2				
02N					
02Φ					
02P					

1 SREF(1)	11 SREF(2)	21 LREF(1)	31 LREF(2)	41 BREF(1)	51 BREF(2)	61 XMRP(1)	71 XMRP(2)
10.732	SQ. INCHES	12.874	INCHES	14.980	INCHES	4.979	INCHES

YMRP(1)	YMRP(2)	ZMRP(1)	ZMRP(2)	SCALE(1)	SCALE(2)	FILREF
0.0 INCHES	10.455	INCHES	10.0035	SCALE	NA 70 446	

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(3)

TEST TWT-468 DAT SET DESCRIPTOR SHEET

Force - Delta Wing Orbiter, 0.0035-Scale, Stability and Control

DATA SET IDENTIFIER	DATA SET DESCRIPTOR (1 / 11 / 21 / 31 / 41)	Mode Type	CURVE SLOPE RANGE 51 LOWER LIMIT	61 UPPER LIMIT
B21 03M	MSF.C468. NB DELTA ORBITER B5W1.4E3	2.1	-2.5	2.5
03N				
03Φ				
03P				
38M	B5W1.3E2.V1.4R4X			
38N				
38Φ				
38P				
04M	B5.W1.3E2.V1.4R4			
04N				
04Φ				
04P				
12M	V1+1.0			
12N				
12Φ				
12P				
13M	V1+2.0			
13N				
13Φ				
13P				

1 SREF(1)	11 SREF(2)	21 LREF(1)	31 LREF(2)	41 BREF(1)	51 BREF(2)	61 XMRP(1)	71 XMRP(2)
10.732	SQ. INCHES	2.874	INCHES	14.980	INCHES	14.979	INCHES

YMRP(1)	YMRP(2)	ZMRP(1)	ZMRP(2)	SCALE(1)	SCALE(2)	FILREF
0.0 INCHES		0.455	INCHES	0.0035	SCALE	NA 70 446

TEST TWT-468 DAT SET DESCRIPTOR SHEET

Force - Delta Wing Orbiter, 0.0025-Scale. Stability and Control

DATA SET IDENTIFIER	DATA SET DESCRIPTOR (1 / 11 / 21 / 31 / 41)	Mode	Type	CURVE SLOPE RANGE (51) LOWER LIMIT	(61) UPPER LIMIT
R21 14M	MS.FC468 NR1 DELTA ORBITER B.SW.1 3E2V.1 4R4 .81.1.0	2	1	-2.5	2.5
14N					
14Φ					
14P					
15M	R-20				
15N					
15Φ					
15P					
28M	B.SW.1 4E3.V.1 GK				
28N					
28Φ					
28P					
29M	B.SW.1 4E3.V.1 7				
29N					
36M	B.SW.1 4E3.V.1 7K				
36N					
36Φ					
36P					

1 SREF(1)	11 SREF(2)	21 LREF(1)	31 LREF(2)	41 BREF(1)	51 BREF(2)	61 XMRP(1)	71 XMRP(2)
10.732	59 INCHES	12.874	INCHES	14.980	INCHES	14.979	INCHES

YMRP(1)	YMRP(2)	ZMRP(1)	ZMRP(2)	SCALE(1)	SCALE(2)	FILREF
0.0	INCHES	10.455	INCHES	10.0035	SCALE	NA 7c 446

TEST TWT-468 DATA SET DESCRIPTOR SHEET

Force-Straight Wing Orbiter, 0.0035-Scale, Stability and Control

DATA SET IDENTIFIER	DATA SET DESCRIPTOR (1 / 11 / 21 / 31 / 41)	Mode Type	CURVE SLOPE RANGE LOWER LIMIT (51)	CURVE SLOPE RANGE UPPER LIMIT (61)
R2117A	MSFC468 NQ1 ST. ORBITER B6	1.1	0.0	10.0
17D				
17E				
18A	B6W1.0		0.0	10.0
18D				
18E				
19A	B6W1.0H1.2		0.0	10.0
19D				
19E				
20A	B6W1.0H1.2V.5		0.0	10.0
21A	H+1.0			
37D	B6W1.0H1.2X			
30D	B6W1.0H1.2			
22A	B6W1.0H1.2V.5 H-1.0		0.0	10.0
23A	H-3.0			
41D	B6W1.0H1.2X			
31D	B6W1.0H1.2			
31E				
24A	B6W1.0H1.2V.5 H-3.0		0.0	10.0
24D	B6W1.0H1.2X			

1 SREF(1)	11 SREF(2)	21 LREF(1)	31 LREF(2)	41 BREF(1)	51 BREF(2)	61 XMRP(1)	71 XMRP(2)
5.440	59 INCHES	11.130	INCHES	5.215	INCHES	4.526	INCHES

YMRP(1)	YMRP(2)	ZMRP(1)	ZMRP(2)	SCALE(1)	SCALE(2)	FILREF
0.0	INCHES	-0.178	INCHES	0.0035	SCALE	NA 70 446

TEST TWT-468 DATA SET DESCRIPTOR SHEET

Force-Straight Wing Orbiter, 0.0035-Scale. Stability and Control

DATA SET IDENTIFIER	DATA SET DESCRIPTOR (1 / 11 / 21 / 31 / 41)	Mode Type	CURVE SLOPE RANGE LOWER LIMIT (51)	CURVE SLOPE RANGE UPPER LIMIT (61)
R2132D	M,S,F,C,468,NR1,ST.ORBITER,B,6W11.0H1.2	1,1		
32E	Hi-3.0			
25A	B,6W11.0H1.2N5, Hi-4.0		0.0	10.0
43D	B,6W11.0H1.2X			
33D	B,6W11.0H1.2			
33E				
26E	Hi-5.0			
27E	HH2.0			
34E	Hi-2.0R-5.0L			
17U	B,6	2,1	-2.5	3.5
17T				
18U	B,6W11.0			
18R				
18T				
19U	B,6W11.0H1.2			
19R				
19T				

51

1 SREF(1)	11 SREF(2)	21 LREF(1)	31 LREF(2)	41 BREF(1)	51 BREF(2)	61 XMRP(1)	71 XMRP(2)
5.440	59 INCHES	11.130	INCHES	5.215	INCHES	14.526	INCHES

YMRP(1)	YMRP(2)	ZMRP(1)	ZMRP(2)	SCALE(1)	SCALE(2)	FILREF
0.0	INCHES	-0.178	INCHES	0.0035	SCALE	NA 70 446

(7)

TEST TWT-468 DAT/ SET DESCRIPTOR SHEET

Force - Straight Wing Orbiter, 0.0035 - Scale. Stability and Control

DATA SET IDENTIFIER	DATA SET DESCRIPTOR (1 / 11 / 21 / 31 / 41)	Mode Type	CURVE SLOPE RANGE (51) LOWER LIMIT	(61) UPPER LIMIT
R2120U	MSFC468 NAV ST. ORB. TER. B6W1.0H.12V5.	2.1	-2.5	2.5
20R				
44S	B6W1.0H.12V5.X			
39A	B6X MIN. RMS	1.1	0.0	10.0
39D				
39E				
40A	MIN. RMS		0.0	10.0
40D				
40E				

1 SREF(1)	11 SREF(2)	21 LREF(1)	31 LREF(2)	41 BREF(1)	51 BREF(2)	61 XMRP(1)	71 XMRP(2)
5.440	59 INCHES	11.130	INCHES	5.215	INCHES	4.526	INCHES

YMRP(1)	YMRP(2)	ZMRP(1)	ZMRP(2)	SCALE(1)	SCALE(2)	FILREF
0.0	INCHES	-0.178	INCHES	0.0035	SCALE	NAS 70 446

TEST FACILITY

The Marshall Space Flight Center 14" x 14" Trisonic Wind Tunnel is an intermittent blowdown tunnel which operates by high pressure air flowing from storage to either vacuum or atmospheric conditions. A Mach number range from .2 to 5.85 is covered by utilizing two interchangeable test sections. The transonic section permits testing at Mach 0.20 through 2.50, and the supersonic section permits testing at Mach 2.74 through 5.85. Mach numbers between .2 and .9 are obtained by using a controllable diffuser. The range from .95 to 1.3 is achieved through the use of plenum suction and perforated walls. Mach numbers of 1.44, 1.93 and 2.50 are produced by interchangeable sets of fixed contour nozzle blocks. Above Mach 2.50 a set of fixed contour nozzle blocks are tilted and translated automatically to produce any desired Mach number in .25 increments.

Air is supplied to a 6000 cubic foot storage tank at approximately -40°F dew point and 500 psi. The compressor is a three-stage receiprocating unit driven by a 1500 hp motor.

The tunnel flow is established and controlled with a servo actuated gate valve. The controlled air flows through the valve diffuser into the stilling chamber and heat exchanger where the air temperature can be controlled from ambient to approximately 180°F. The air then passes through the test section which contains the nozzle blocks and test region.

Downstream of the test section is a hydraulically controlled pitch sector that provides a total angle of attack range of 20° (±10°). Sting offsets are available for obtaining various maximum angles of attack up to 25°.

The diffuser section has movable floor and ceiling panels which are the primary means of controlling the subsonic Mach numbers and permit more efficient running supersonically. The sector assembly and supersonic diffuser telescope into the subsonic diffuser to allow easy access to the model and test section.

Tunnel flow is exhausted through an acoustically damped tower to atmosphere or into the vacuum field of 42,000 cubic feet. The vacuum tanks are evacuated by vacuum pumps driven by a total of 500 hp.

Data is recorded by a solid state digital data acquisition system. The digital data is transferred to punched cards during the run to be reduced later by a computer to proper coefficient form.

The tunnel components and performance are discussed in more detail in NASA TM X-53185, dated December 22, 1964, and NASA TM X-53113, dated August 20, 1964.

NOMENCLATURE

SYMBOL	SADSAC SYMBOL	DEFINITION
A_b		base area; m^2, ft^2, in^2
a		speed of sound; m/sec, ft/sec
AR	ASPECT	aspect ratio, b^2/S
b	REFB	wing span or reference span; m, ft, in
c		wing chord; m, ft, in
$\bar{c}$		wing mean aerodynamic chord or reference chord; m, ft, in (see ℓ_{ref} or refl)
c.g.		center of gravity
C.P.		center of pressure
C_A	CA	axial force coefficient, F_A/qS_{ref}
C_{A_b}	CAB	base axial force coefficient, $[(p_\infty - p_b)/q]$ (A_b/S_{ref})
C_{A_f}	CAF	forebody axial force coefficient, $C_A - C_{A_b} - C_{A_{bc}}$
C_D	CDTOTL	drag force coefficient in the wind axis system, $F_D/q\,S_{ref}$
$C_{A_{bc}}$		balance cavity force coefficient

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
C_D'	CD	drag force coefficient in the stability axis system, $F_D'/q\,S_{ref}$
C_L	CL	lift force coefficient (stability or wind axis) $F_L/q\,S_{ref}$
C_ℓ	CBL	rolling moment coefficient in body axis system, $M_x/q\,S_{ref}\,b$
$C_{\ell,s}$	CSL	rolling moment coefficient in the stability axis system, $M_{x,s}/q\,S_{ref}\,b$
$C_{\ell,w}$	CWL	rolling moment coefficient in the wind axis system, $M_{x,w}/q\,S_{ref}\,b$
C_m	CLM	pitching moment coefficient in the body axis system, $M_y/q\,S_{ref}\,\ell_{ref}$
$C_{m,s}$	CLM	pitching moment coefficient in the stability axis system, $C_{m,s} = C_m$
$C_{m,w}$	CPM	pitching moment coefficient in the wind axis system, $M_{y,w}/q\,S_{ref}\,\ell_{ref}$
C_N	CN	normal force coefficient in the body axis system, $F_N/q\,S_{ref}$

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
C_n	CYN	yawing moment coefficient in the body axis system, $M_z/q\,S_{ref}\,b$
$C_{n,s}$	CLN	yawing moment coefficient in the stability axis system, $C_{n,s} = C_n$
$C_{n,w}$	CLN	yawing moment coefficient in the wind axis system, $M_{z,w}/q\,S_{ref}\,b$
C_p	CP	pressure coefficient, $(p-p_\infty)/q$
C_y	CY	side force coefficient (body or stability axis system), $F_y/q\,S_{ref}$
C_c	CC	side force coefficient (wind axis system), $F_y/q\,S_{ref}$
F_A		axial force; N, lb
F_D		drag force in wind axis system; N, lb
F'_D		drag force in the stability axis system; N, lb
F_L		lift force (stability or wind axis system); N, lb
F_N		normal force; N, lb

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
F_Y		side force; N, lb
	N/A	normal to axial force ratio
ℓ_{ref}	REFL	reference length; m, ft, in (see $\bar{c}$)
L/D	L/D	lift-to-drag ratio, C_L/C_D (stability axis system)
L/D	CL/CD	lift-to-drag ratio, C_L/C_D (wind axis system)
M	MACH	Mach number
MRP	MRP	abbreviation for moment reference point
	XMRP	abbreviation for moment reference point on x-axis
	YMRP	abbreviation for moment reference point on y-axis
	ZMRP	abbreviation for moment reference point on z-axis
M_x		rolling moment in the body axis system; N-m, ft-lb
$M_{x,s}$		rolling moment in the stability axis system; N-m, ft-lb

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
$M_{x,w}$		rolling moment in the wind axis system; N-m, ft-lb
M_y		pitching moment in the body (or stability) axis system; N-m, ft-lb
$M_{y,w}$		pitching moment in the wind axis system; N-m, ft-lb
M_z		yawing moment in the body axis system; N-m, ft-lb
$M_{z,w}$		yawing moment in the wind axis system; N-m, ft-lb
p		static pressure; N/m^2; psi
P		total pressure; N/m^2; psi
q	Q(PSI) Q(PSF)	dynamic pressure; N/m^2, psi, psf
RN/L	RN/L	Reynold's number per unit length; million/ft.
S		wing area; m^2, ft^2
S_{ref}	REFS	reference area; m^2, ft^2
T		temperature; °K, °C, °R, °F
V		speed of vehicle relative to surrounding atmosphere; m/sec, ft/sec
	XCP/L	center of pressure location based on body length $\left(X_{cg} - \frac{CLM \cdot \bar{c}}{CN}\right) \ell_B$
ℓ_B		body length

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
i_T		tail incidence positive when trailing edge down, deg
$\bar{V}$		velocity of vehicle relative to surrounding atmosphere; m/sec, ft/sec
α	ALPHA	angle of attack, angle between the projection of the wind X_W-axis on the body X, Z-plane and the body X-axis; deg
β	BETA	sideslip angle, angle between the wind X_W-axis and the projection of this axis on the body X-Z-plane; deg
γ		ratio of specific heats
Γ	DIHDRL	wing dihedral angle; deg
δ		control surface deflection angle; deg positive deflections are:
	AILRON	aileron - left aileron trailing edge down
	ELVATR	elevator - trailing edge down
	RUDDER	rudder - trailing edge to the left
	FLAP	flap - trailing edge down
	TAB	tab - trailing edge down with respect to control surface
δ_H	HRZNTL	horizontal stabilizer - trailing edge down
δ_V	VRTICL	vertical stabilizer - trailing edge outboard

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
θ		pitch angle, angle of rotation about the body Y-axis, positive when the positive Z-axis is rotated toward the positive X-axis; deg
ϕ	PHI	roll angle, angle of rotation about the body X-axis, positive when the positive Y-axis is rotated toward the positive Z-axis; deg
ψ	PSI	yaw angle, angle of rotation about the body Z-axis, positive when the positive X-axis is rotated toward the positive Y-axis; deg

NOMENCLATURE (continued)

SUBSCRIPTS	DEFINITION
a	aileron
b	base
c	canard
e	elevator or elevon
f	flap
r	rudder or ruddervator
s	stability axis system
t	tail, or total conditions
w	wind axis system
ref	reference conditions
∞	freestream condition

FIGURES

Notes:

1. Positive directions of force coefficients moment coefficients, and angles are indicated by arrows.

2. For clarity, origins of wind and stability axes have been displaced from the center of gravity.

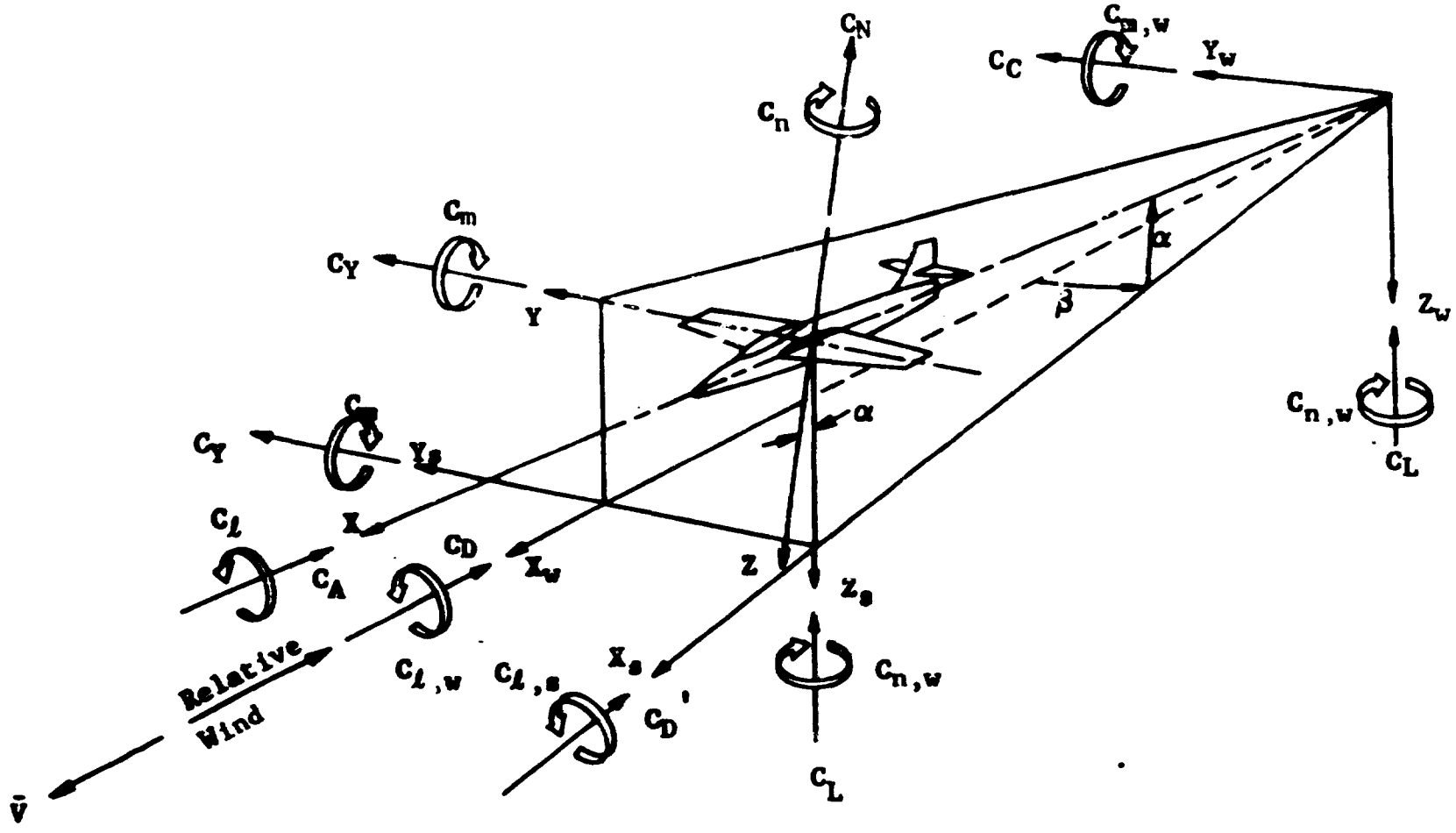


Figure 18. Axis systems, showing direction and sense of force and moment coefficients, angle of attack, and sideslip angle

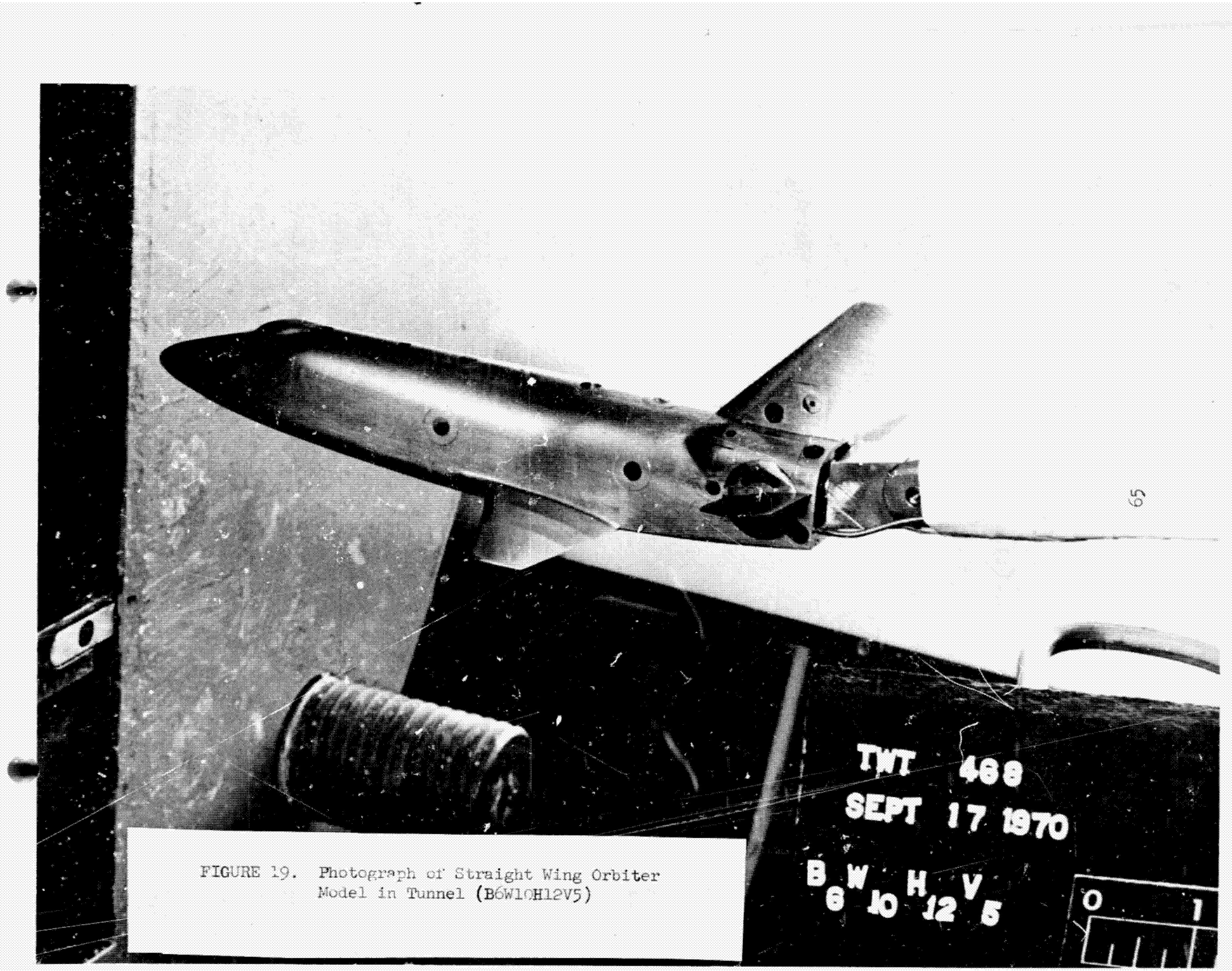


FIGURE 19. Photograph of Straight Wing Orbiter Model in Tunnel (B6W10H12V5)

FIGURE 20. Photograph of Delta Wing Orbiter Model in Tunnel (b5W13E2V14R4)

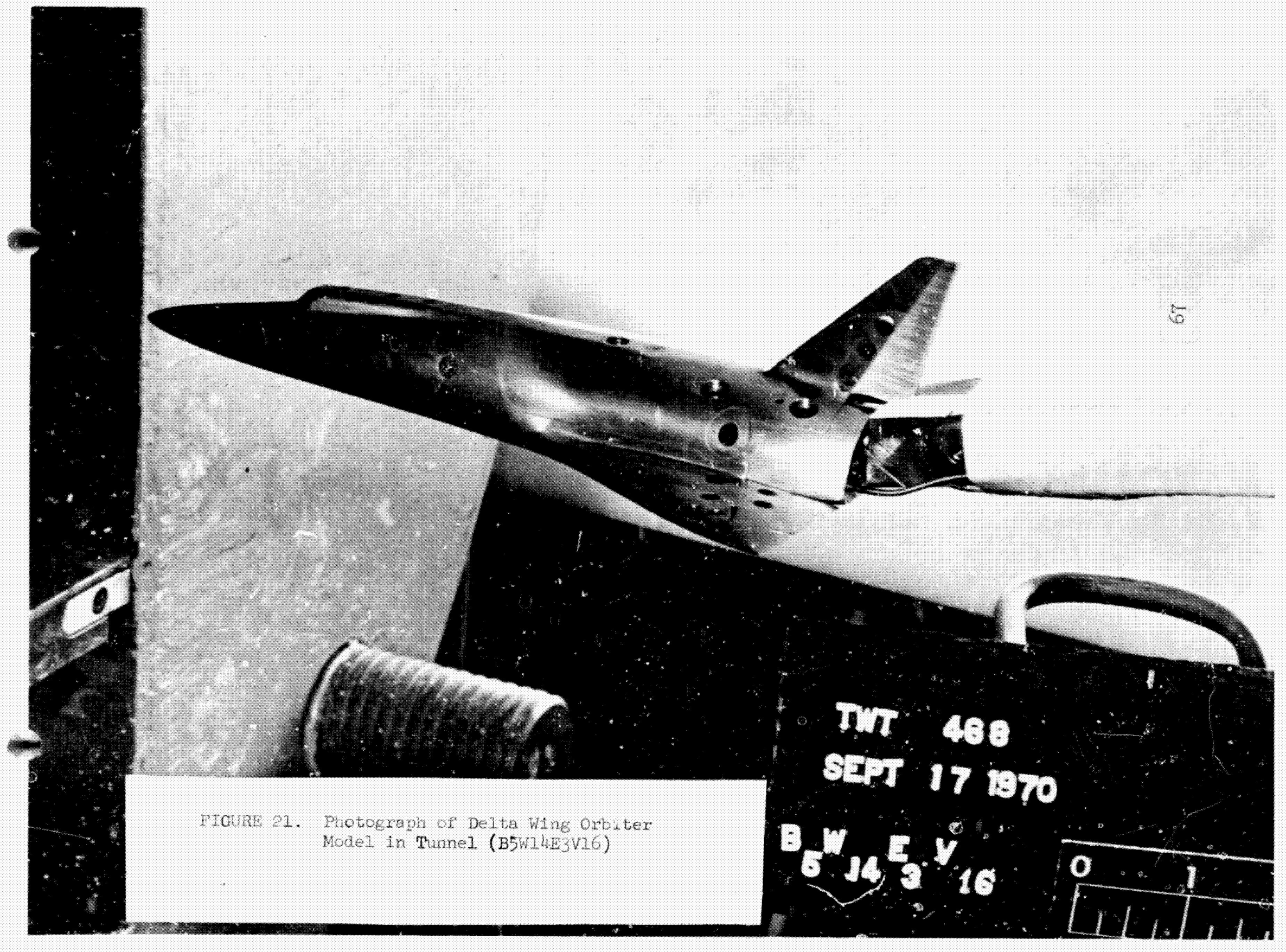


FIGURE 21. Photograph of Delta Wing Orbiter Model in Tunnel (B5W14E3V16)

DATA DISPLAY INDEX

COMPONENT BUILDUP EFFECTS IN PITCH STRAIGHT WING ORBITER (B6)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED:
S2117S S2118S S2119S V2120A

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CN	ALPHA	1	3
CAI	ALPHA	4	6
CL	ALPHA	7	9
CDF	ALPHA	10	12
L/D	ALPHA	13	15
CLM	ALPHA	16	18

DATASETS PLOTTED:
F2117S F2118S F2119S F2120A

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
XCP/L	ALPHA	19	21

DEPENDENT VARIABLE VS DEPENDENT VARIABLE

DATASETS PLOTTED:
S2117S S2118S S2119S V2120A

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CL	CLM	22	24
CL	CDF	25	27

HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W1DH12V5)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
V2125A V2124A V2123A V2122A V2120A V2121A

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CN	ALPHA	28	30
CAF	ALPHA	31	33
CL	ALPHA	34	36
CDF	ALPHA	37	39
L/D	ALPHA	40	42
CLM	ALPHA	43	45

DATASETS PLOTTED:
F2125A F2124A F2123A F2122A F2120A F2121A

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
XCP/L	ALPHA	46	48

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
V2125A V2124A V2123A V2122A V2120A V2121A

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CL	CLM	49	51
CL	CDF	52	54

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W1UH12)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
V2133D V2132D V2131D V2119D V2130D

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CN	ALPHA	55	57
CAF	ALPHA	58	60
CL	ALPHA	61	63
CDF	ALPHA	64	66
L/D	ALPHA	67	69
CLM	ALPHA	70	72
XCP/L	ALPHA	73	75

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
V2133D V2132D V2131D V2119D V2130D

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CL	CLM	76	78
CL	CDF	79	81

HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (66W10H12)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
V2126E V2133E V2132E V2131E D2119E V2127E

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CN	ALPHA	82	83
CAF	ALPHA	84	85
CL	ALPHA	86	87
CDF	ALPHA	88	89
L/D	ALPHA	90	91
CLM	ALPHA	92	93
XCP/L	ALPHA	94	95

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
V2126E V2133E V2132E V2131E D2119E V2127E

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	96	97
CL	CDF	98	99

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (66*10H12)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
X2134E M21191

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CN	ALPHA	100	101
CAF	ALPHA	102	103
CL	ALPHA	104	105
CDF	ALPHA	106	107
L/D	ALPHA	108	109
CLM	ALPHA	110	111
XCP/L	ALPHA	112	113
CY	ALPHA	114	115
CLN	ALPHA	116	117
CSL	ALPHA	118	119

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
X2134E M21191

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	120	121
CL	CDF	122	123

HORIZONTAL STABILIZER EFFECTIVENESS FOR LOW ALPHA RANGE(0 TO 20DEG) (B6W10H12V5)

DEPENDENT VARIABLE VS PARAMETRIC VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
M2125A M2124A M2123A M2122A M2120A M2121A

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DELCLM	HRZNTL	124	126
DELCDF	HRZNTL	127	129
DELCL	HRZNTL	130	132

HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (B6W10H12)

DEPENDENT VARIABLE VS PARAMETRIC VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
M2133D M2132D M2131D M2119D M2130D

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DELCLM	HRZNTL	133	135
DELCDF	HRZNTL	136	138
DELCL	HRZNTL	139	141

HORIZONTAL STABILIZER EFFECTIVENESS FOR HIGH ALPHA RANGE(40 TO 60DEG) (B6W10H12)

DEPENDENT VARIABLE VS PARAMETRIC VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
M2126E M2133E M2132E M2131E M2119E M2127E

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DELCLM	HRZNTL	142	143
DELCDF	HRZNTL	144	145
DELCL	HRZNTL	146	147

HORIZONTAL STABILIZER EFFECTIVENESS FOR LOW ALPHA RANGE(0 TO 20DEG) (B6W1UH12V5)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
P2120A	DCLMDH	ALPHA	148	148
P2120A	DCDFDH	ALPHA	149	149
P2120A	DCL/DH	ALPHA	150	150

HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (B6W1UH12)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
P2119D	DCLMDH	ALPHA	151	151
P2119D	DCDFDH	ALPHA	152	152
P2119D	DCL/DH	ALPHA	153	153

HORIZONTAL STABILIZER EFFECTIVENESS FOR HIGH ALPHA RANGE(40 TO 60DEG) (B6W1UH12)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
P2119E	DCLMDH	ALPHA	154	154
P2119E	DCDFDH	ALPHA	155	155
P2119E	DCL/DH	ALPHA	156	156

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 0 DEG. (ST.WO)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED:
V2117Q V2118Q V2119Q V2120Q

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	BETA	157	158
CLN	BETA	159	160
CSL	BETA	161	162

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA=10 DEG. (ST.WO)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED:
V2118R V2119R V2120R

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	BETA	163	164
CLN	BETA	165	166
CSL	BETA	167	168

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA=60 DEG. (ST.WO)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED:
V2117T V2118T V2119T

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	BETA	169	170
CLN	BETA	171	172
CSL	BETA	173	174

LATERAL-DIRECTIONAL DERIVATIVES (B6)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2117Q K2117T

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING / ENDING	
CY	ALPHA	175	176
CLN	ALPHA	177	178
CSL	ALPHA	179	180

LATERAL-DIRECTIONAL DERIVATIVES (B6W1G)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2118Q K2118R K2118T

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING / ENDING	
CY	ALPHA	181	182
CLN	ALPHA	183	184
CSL	ALPHA	185	186

LATERAL-DIRECTIONAL DERIVATIVES (B6W1OH12)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2119Q K2119R K2119T

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING / ENDING	
CY	ALPHA	187	188
CLN	ALPHA	189	190
CSL	ALPHA	191	192

LATERAL-DIRECTIONAL DERIVATIVES (86W10H12V5)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2120Q K2120R K2144S

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	ALPHA	193	194
CLN	ALPHA	195	196
CSL	ALPHA	197	198

COMPONENT BUILDUP EFFECTS IN PITCH DELTA WING ORBITER (B5)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED:
S2101S S2102S S2103S S2104S

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CN	ALPHA	199	199
CAF	ALPHA	200	200
CL	ALPHA	201	201
CDF	ALPHA	202	202
L/D	ALPHA	203	203
CLM	ALPHA	204	204

DATASETS PLOTTED:
F2101S F2102S F2103S F2104S

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
XCP/L	ALPHA	205	205

DEPENDENT VARIABLE VS DEPENDENT VARIABLE

DATASETS PLOTTED:
S2101S S2102S S2103S S2104S

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	206	206
CL	CDF	207	207

EFFECTS OF ELEVATOR DEFLECTION IN PITCH (B5W13E2V14R4)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
S2110S S2108S S2107S S2106S S2104S S2105S

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CN	ALPHA	208	208
CAF	ALPHA	209	209
CL	ALPHA	210	210
CDF	ALPHA	211	211
L/D	ALPHA	212	212
CLM	ALPHA	213	213

DATASETS PLOTTED:
F2110S F2108S F2107S F2106S F2104S F2105S

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
XCP/L	ALPHA	214	214

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
S2110S S2108S S2107S S2106S S2104S S2105S

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CL	CLM	215	215
CL	CDF	216	216

DATA PLOT INDEX

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
M2111S S2104S

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CN	ALPHA	217	217
CAF	ALPHA	218	218
CL	ALPHA	219	219
CDF	ALPHA	220	220
L/D	ALPHA	221	221
CLM	ALPHA	222	222
XCP/L	ALPHA	223	223
CY	ALPHA	224	224
CLN	ALPHA	225	225
CSL	ALPHA	226	226

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
M2111S S2104S

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	227	227
CL	CDF	228	228

ELEVATOR EFFECTIVENESS (B5W13E2V14R4)

DEPENDENT VARIABLE VS PARAMETRIC VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
M2110S M2108S M2107S M2106S M2104S M2105S

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DELCLM	ELVATR	229	230
DELCDF	ELVATR	231	232
DELCL	ELVATR	233	234

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
P2104S	DCLMDE	ALPHA	235	235
P2104S	DCDFDE	ALPHA	236	236
P2104S	DCL/DE	ALPHA	237	237

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 0 DEG. (DW0)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED:
V2101M V2102M V2103M D2104M

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CY	BETA	238	238
CLN	BETA	239	239
CSL	BETA	240	240

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 15 DEG. (DW0)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED:
V2101N V2102N V2103N D2104N

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CY	BETA	241	241
CLN	BETA	242	242
CSL	BETA	243	243

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 30 DEG. (DW0)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED:
V2101O V2102O V2103O D2104O

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CY	BETA	244	244
CLN	BETA	245	245
CSL	BETA	246	246

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 45 DEG. (DW0)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED:
V2101P V2102P V2103P D2104P

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CY	BETA	247	247
CLN	BETA	248	248
CSL	BETA	249	249

LATERAL-DIRECTIONAL DERIVATIVES (B5)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2101M K2101N K21010 K2101P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	ALPHA	250	250
CLN	ALPHA	251	251
CSL	ALPHA	252	252

LATERAL-DIRECTIONAL DERIVATIVES (B5W13E2)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2102M K2102N K21020 K2102P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	ALPHA	253	253
CLN	ALPHA	254	254
CSL	ALPHA	255	255

LATERAL-DIRECTIONAL DERIVATIVES (B5W14E3)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2103M K2103N K21030 K2103P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	ALPHA	256	256
CLN	ALPHA	257	257
CSL	ALPHA	258	258

LATERAL-DIRECTIONAL DERIVATIVES (BSW13E2V;4R4)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K21C4M K2104N K21040 K2104P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	ALPHA	259	259
CLN	ALPHA	260	260
CSL	ALPHA	261	261

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA = 0 DEG.

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
D2104M V2112M V2113M

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CY	BETA	262	262
CLN	BETA	263	263
CSL	BETA	264	264

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA = 15 DEG.

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
D2104N V2112N V2113N

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CY	BETA	265	265
CLN	BETA	266	266
CSL	BETA	267	267

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA = 30 DEG.

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
D2104O V2112O V2113O

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CY	BETA	268	268
CLN	BETA	269	269
CSL	BETA	270	270

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA = 45 DEG.

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
D2104P V2112P V2113P

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING	
CY	BETA	271	271
CLN	BETA	272	272
CSL	BETA	273	273

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL DERIVATIVES, RUDDER OUTBD = 0 DEG

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2104M K2104N K2104O K2104P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	ALPHA	274	274
CLN	ALPHA	275	275
CSL	ALPHA	276	276

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL DERIVATIVES, RUDDER OUTBD = 10 DEG

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2112M K2112N K2112O K2112P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	ALPHA	277	277
CLN	ALPHA	278	278
CSL	ALPHA	279	279

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL DERIVATIVES, RUDDER OUTBD = 20 DEG

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2113M K2113N K2113O K2113P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	ALPHA	280	280
CLN	ALPHA	281	281
CSL	ALPHA	282	282

INCREMENTAL OUTBOARD RUDDER EFFECTS ON LATERAL DERIVATIVES, (10 DEG RUDDER OUTBD)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
M2104M M2104N M2104O M2104P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DLCY	ALPHA	283	283
DLCLN	ALPHA	284	284
DLCSL	ALPHA	285	285

INCREMENTAL OUTBOARD RUDDER EFFECTS ON LATERAL DERIVATIVES,(10 DEG RUDDER OUTBD)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
M2112M M2112N M2112O M2112P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DLCY	ALPHA	286	286
DLCLN	ALPHA	287	287
DLCSL	ALPHA	288	288

INCREMENTAL OUTBOARD RUDDER EFFECTS ON LATERAL DERIVATIVES,(20 DEG RUDDER OUTBD)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
M2113M M2113N M2113O M2113P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DLCY	ALPHA	289	289
DLCLN	ALPHA	290	290
DLCSL	ALPHA	291	291

RUDDER EFFECTIVENESS AT ALPHA = 0 DEG. (B5W13E2V14R4)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
V2115M V2114M D2104M

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	BETA	292	292
CLN	BETA	293	293
CSL	BETA	294	294

RUDDER EFFECTIVENESS AT ALPHA = 15 DEG. (B5W13E2V14R4)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
V2115N V2114N D2104N

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	BETA	295	295
CLN	BETA	296	296
CSL	BETA	297	297

RUDDER EFFECTIVENESS AT ALPHA = 30 DEG. (B5W13E2V14R4)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
V2115O V2114O D2104O

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	BETA	298	298
CLN	BETA	299	299
CSL	BETA	300	300

RUDDER EFFECTIVENESS AT ALPHA = 45 DEG. (B5W13E2V14R4)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
V2115P V2114P D2104P

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	BETA	301	301
CLN	BETA	302	302
CSL	BETA	303	303

LATERAL-DIRECTIONAL DERIVATIVES FOR RUDDER DEFLECTION =-20 DEG. (B5W13E2V14R4)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2115M K2115N K2115O K2115P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	ALPHA	304	304
CLN	ALPHA	305	305
CSL	ALPHA	306	306

LATERAL-DIRECTIONAL DERIVATIVES FOR RUDDER DEFLECTION =-10 DEG. (B5W13E2V14R4)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2114M K2114N K2114O K2114P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	ALPHA	307	307
CLN	ALPHA	308	308
CSL	ALPHA	309	309

LATERAL-DIRECTIONAL DERIVATIVES FOR RUDDER DEFLECTION = 0 DEG. (B5W13E2V14R4)

GRADIENT FOR DEPENDENT VARIABLE VS PARAMETRIC VARIABLE
PARAMETRIC STUDY

DATASETS PLOTTED:
K2104M K2104N K2104O K2104P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	ALPHA	310	310
CLN	ALPHA	311	311
CSL	ALPHA	312	312

RUDDER EFFECTIVENESS DERIVATIVES (BSW13E2V14R4)

DEPENDENT VARIABLE VS PARAMETRIC VARIABLE, PARAMETRIC STUDY

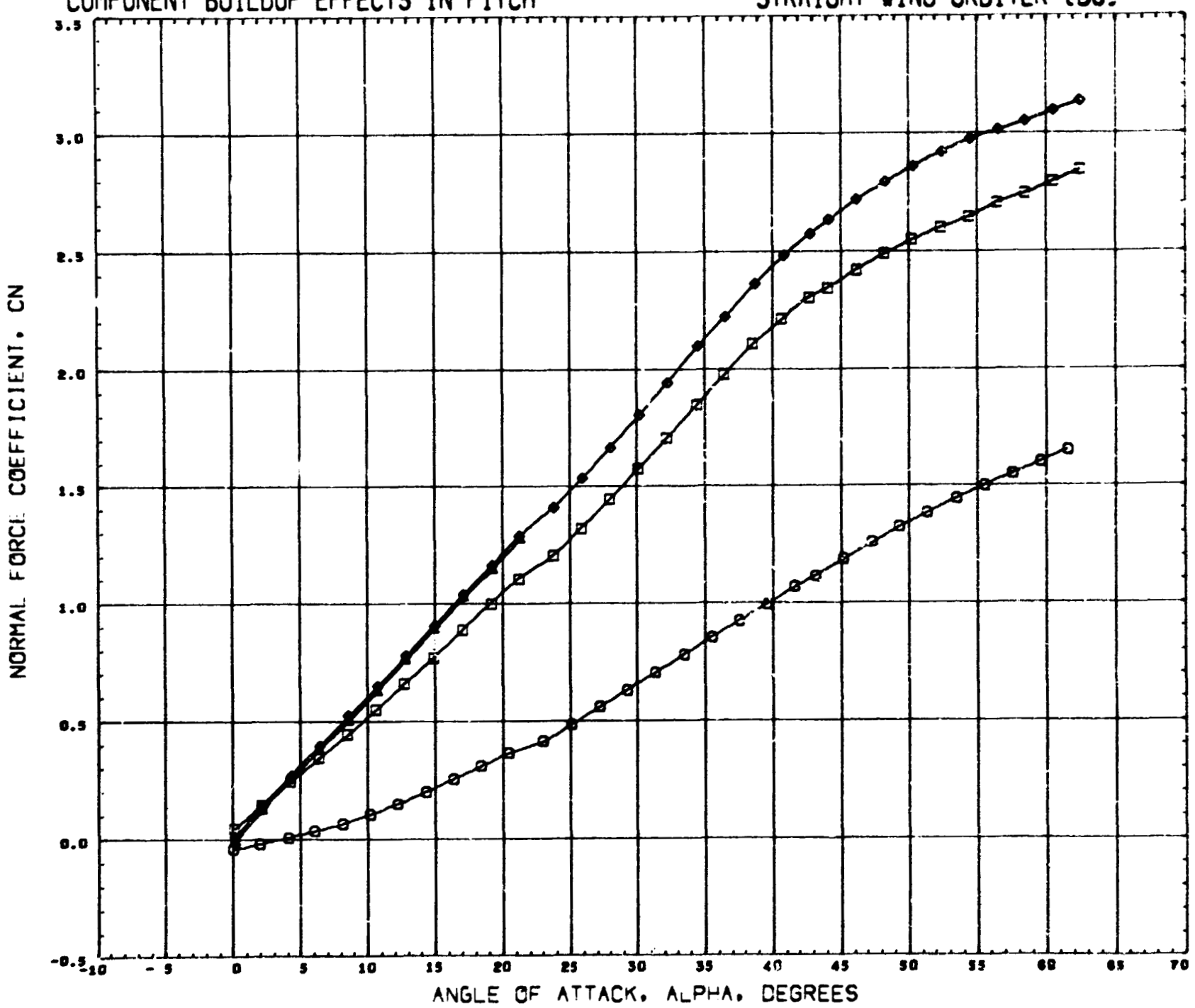
DATASETS PLOTTED:
P2104M P2104N P2104O P2104P

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DCY/DR	ALPHA	313	313
DCLNDR	ALPHA	314	314
DCSLDR	ALPHA	315	315

DATA

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	HSFC 468 NR ST ORBITER B6
(S2116S)	□	HSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	HSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	HSFC468 NR ST ORBITER B6W10H12V5

MACH 1.950

PARAMETRIC VALUES

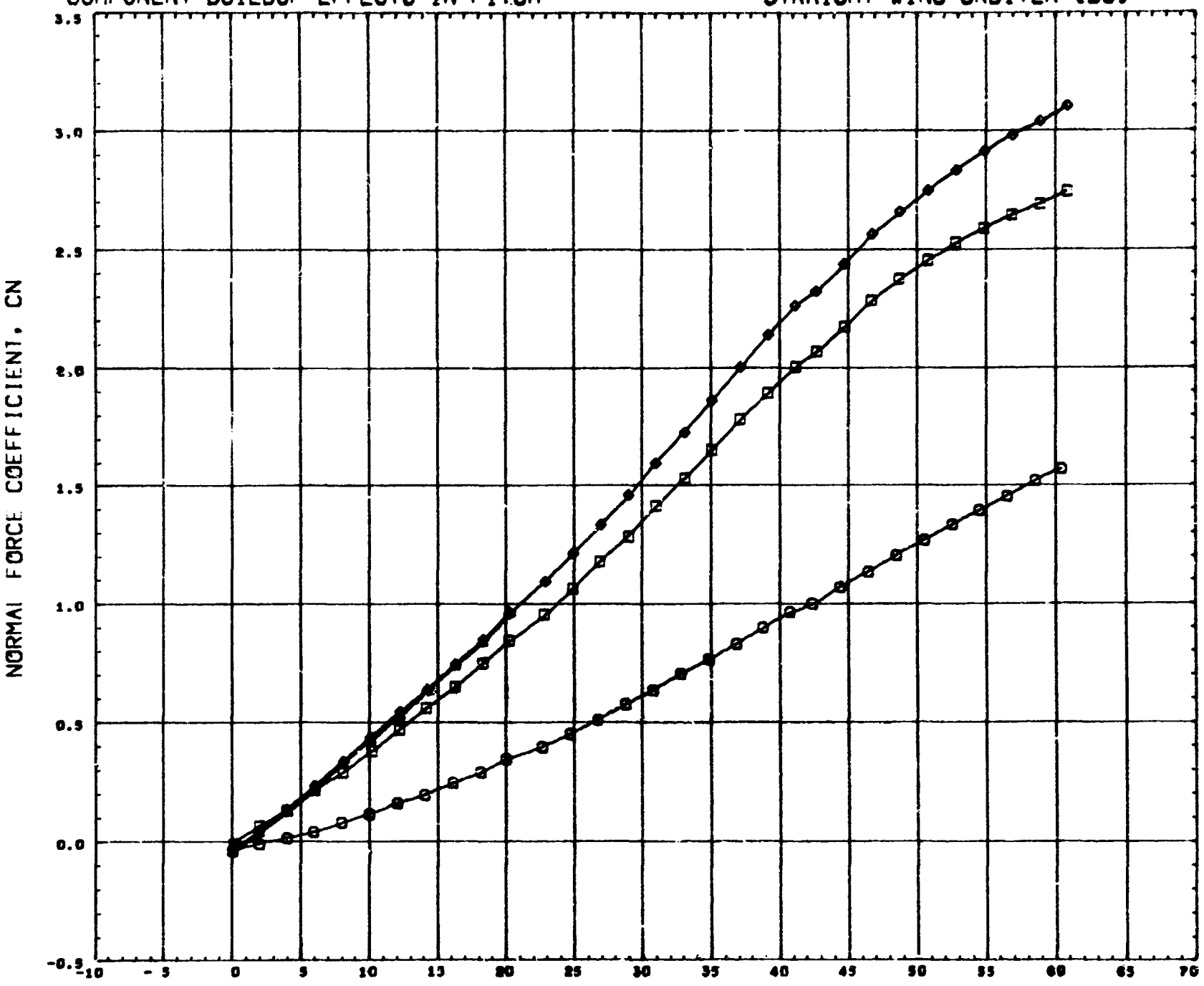
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.520	INCHES
YMRP	0.000	INCHES
ZMRP	-0.170	INCHES
SCALE	0.005	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	MSFC 468 NR ST ORBITER B6
(S2116S)	□	MSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 2.990

PARAMETRIC VALUES

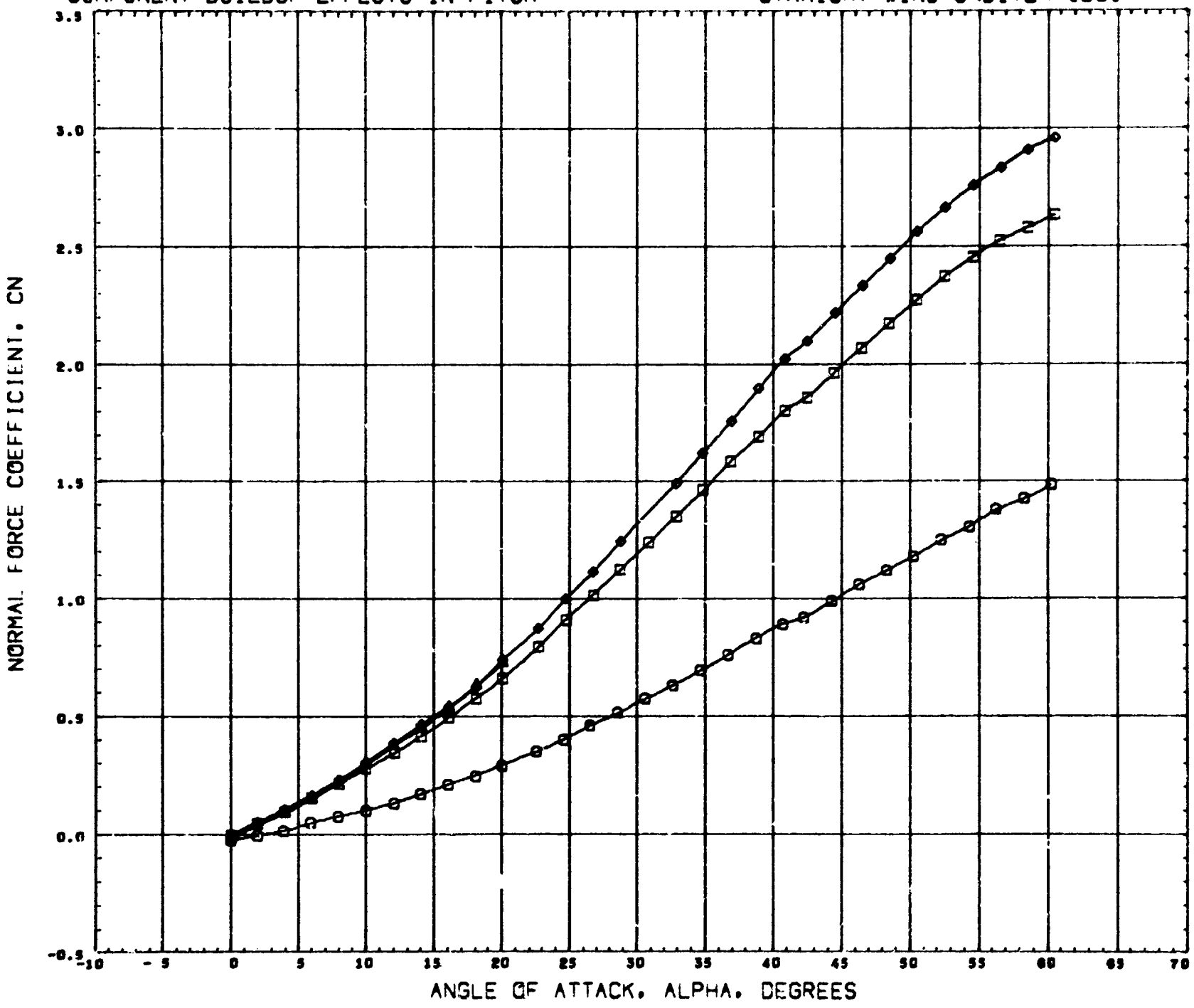
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFE	5.215	INCHES
XMRP	4.520	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.170	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	MSFC 468 NR ST ORBITER B6
(S2116S)	□	MSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 4.959

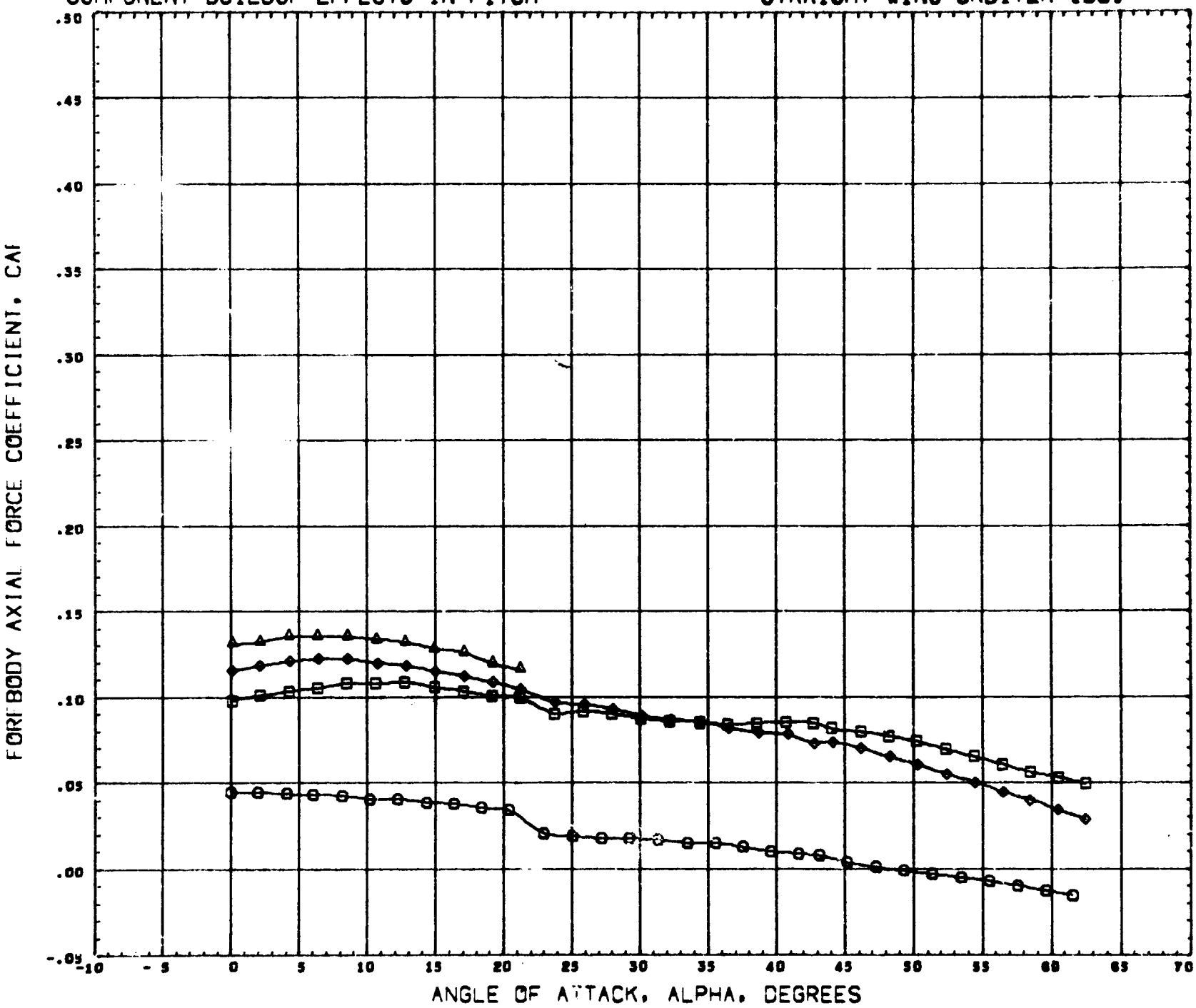
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	5.440	S@INCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S21173)	○	MSFC 468 NR ST ORBITER B6
(S21185)	□	MSFC 468 NR ST ORBITER B6W10
(S21193)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 1.958

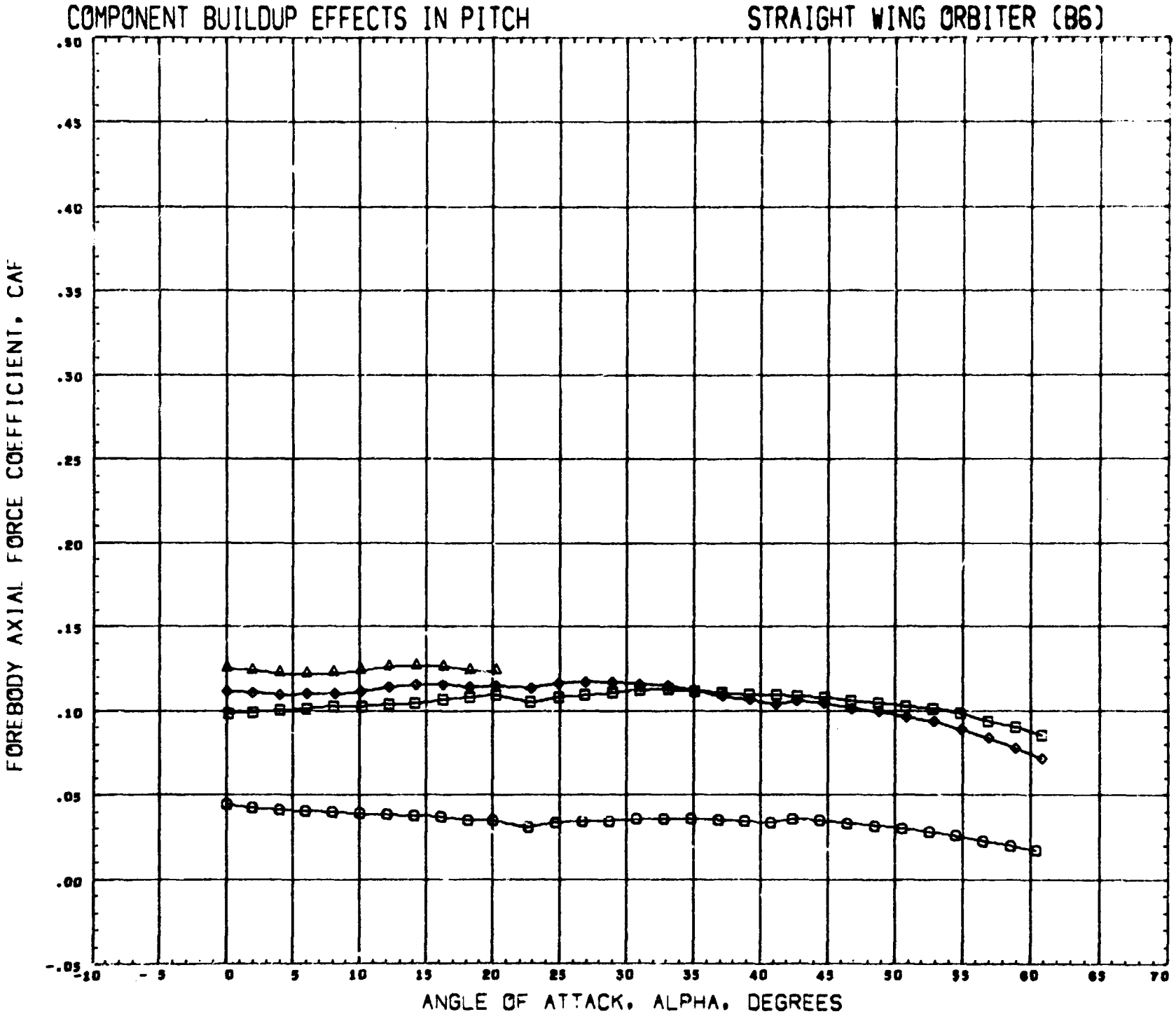
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.170	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S21178)	○	MSFC 468 NR ST ORBITER B6
(S21188)	□	MSFC 468 NR ST ORBITER B6W1O
(S21198)	◇	MSFC 468 NR ST ORBITER B6W1OH1Z
(V2120A)	△	MSFC468 NR ST ORBITER B6W1OH12V5

MACH 2.990

PARAMETRIC VALUES

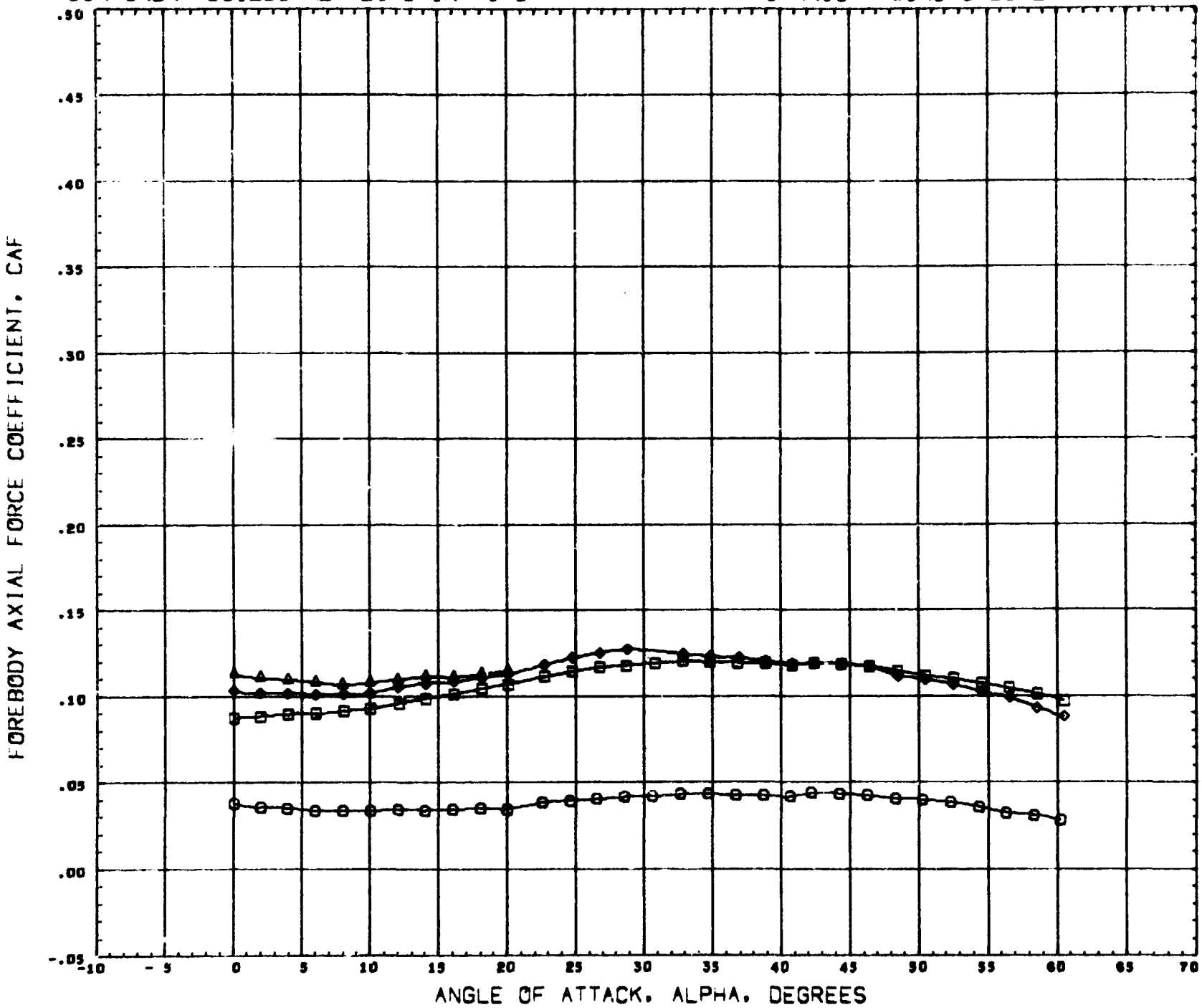
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	MSFC 468 NR ST ORBITER B6
(S2118S)	□	MSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 4.959

PARAMETRIC VALUES

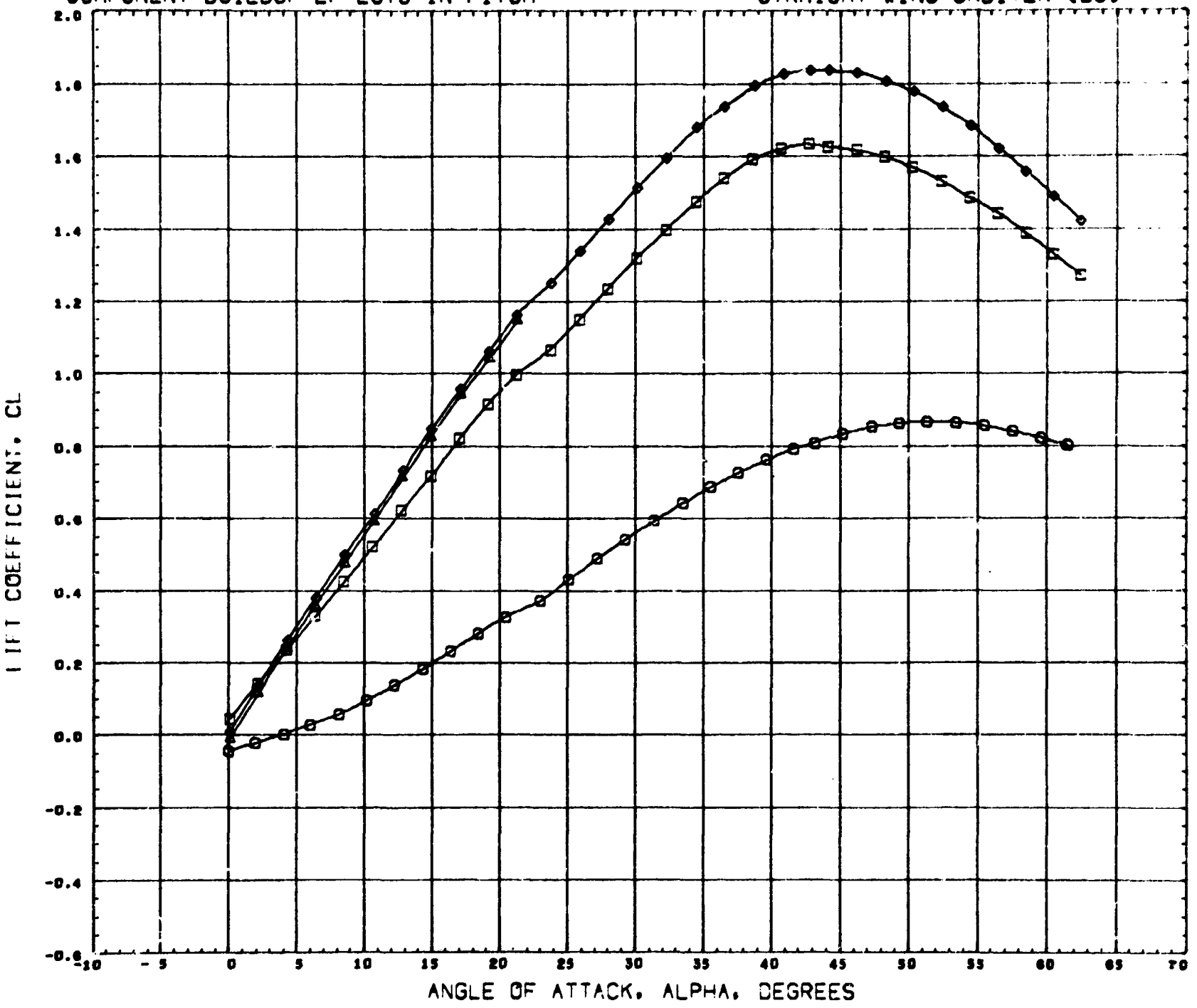
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	NSFC 468 NR ST ORBITER B6
(S2116S)	□	NSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	NSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	NSFC468 NR ST ORBITER B6W10H12V5

MACH 1.950

PARAMETRIC VALUES

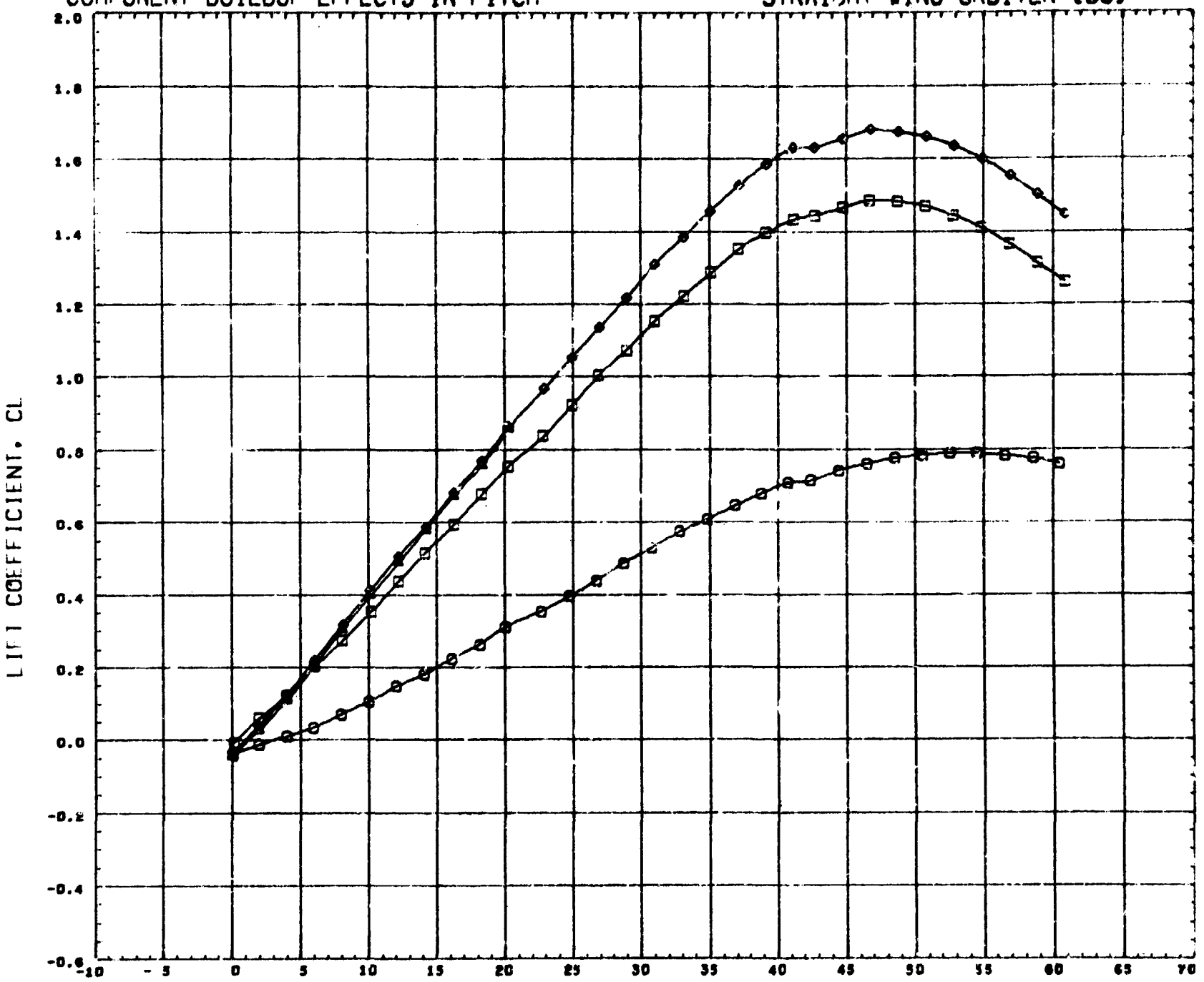
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S21178)	○	MSFC 468 NR ST ORBITER B6
(S21188)	□	MSFC 468 NR ST ORBITER B6W10
(S21198)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 2.990

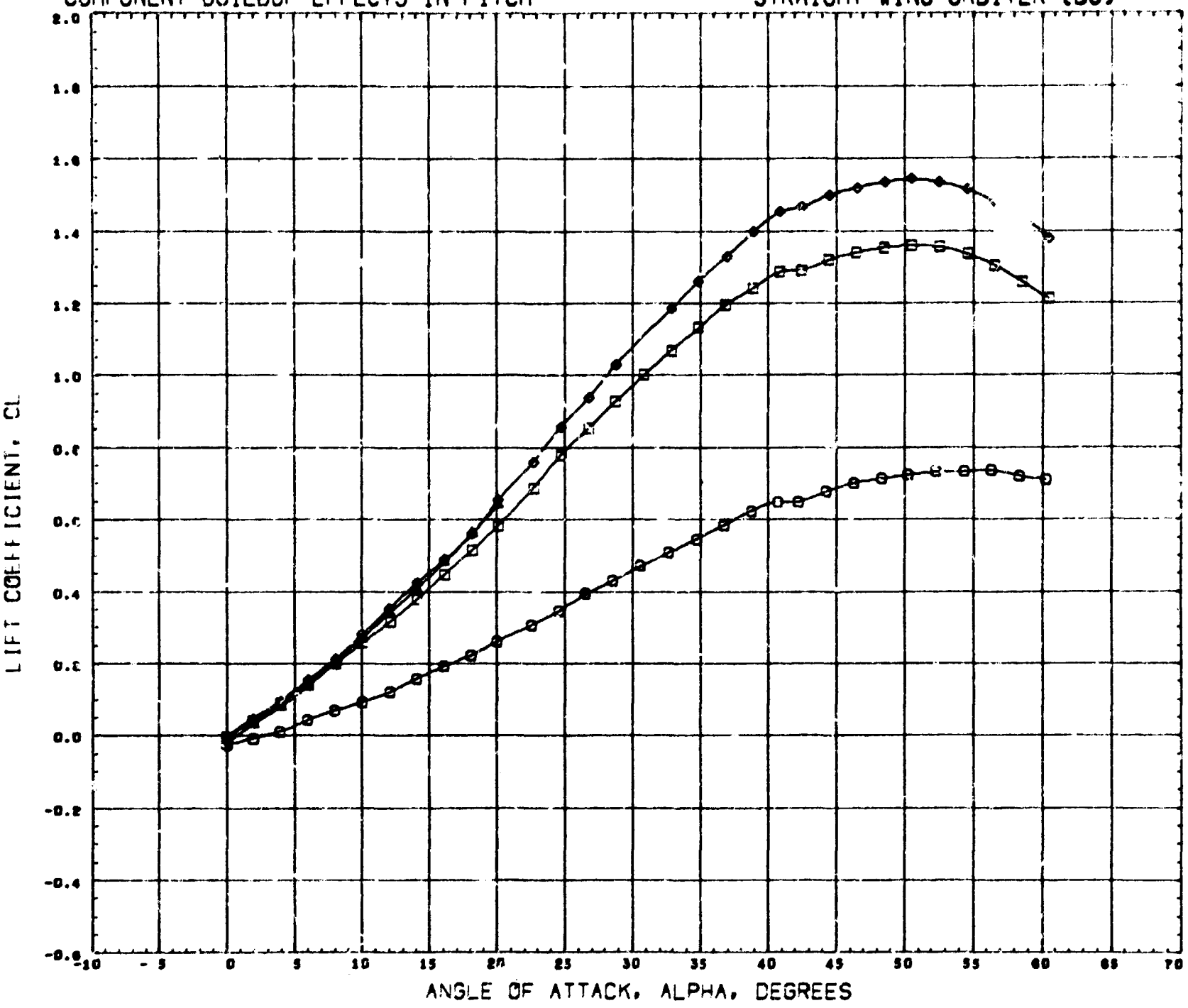
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	-0.170	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S21178)	○	MSFC 468 NR ST ORBITER B6
(S21183)	□	MSFC 468 NR ST ORBITER B6W10
(S21193)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V21208A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 4.959

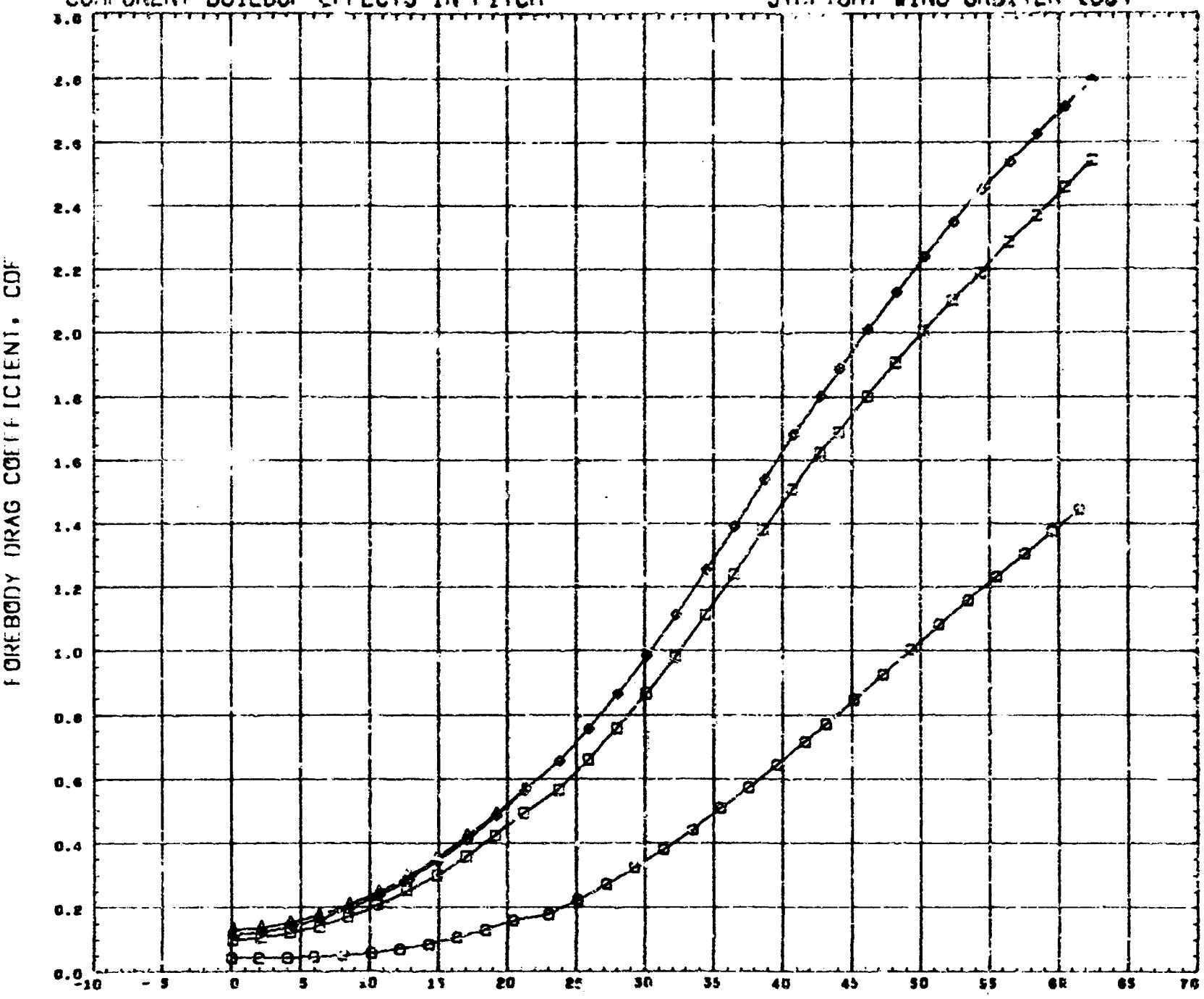
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.926	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH STRAIGHT WING ORBITER (86)



DATA SET	SYMBOL	CONFIGUPATION DESCRIPTION
(S21178)	○	MSFC 468 NR ST ORBITER 86
(S21193)	□	MSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	MSFC 468 NR ST ORBITER B8W10H12
(V2120A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 1.950

PARAMETRIC VALUES

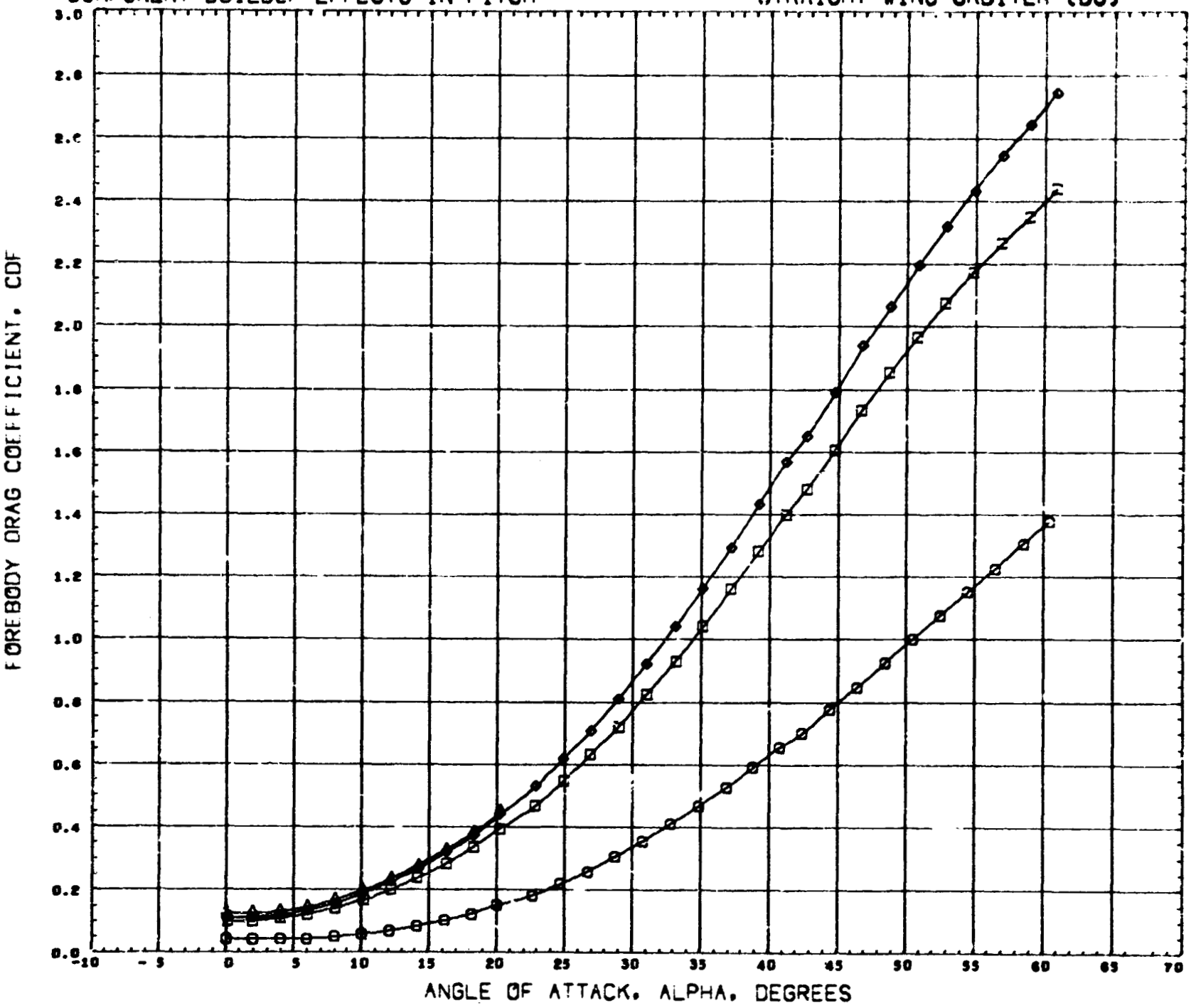
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	-0.178	INCHES
SCALE	0.005	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S21178)	○	MSFC 468 NR ST ORBITER B6
(S21183)	□	MSFC 468 NR ST ORBITER B6W10
(S21193)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC/98 NR ST ORBITER B6W10H12V5

MACH 2.990

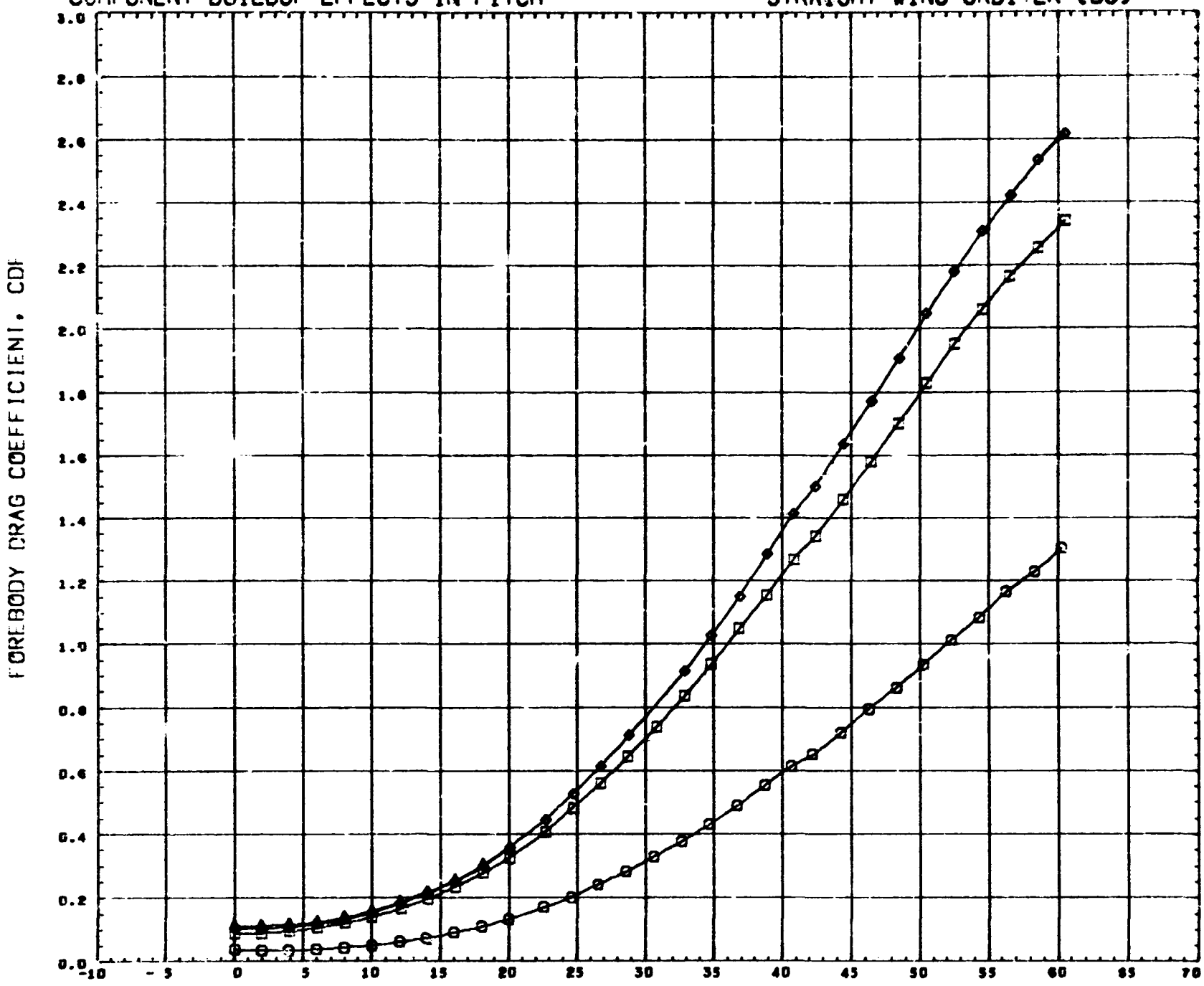
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	MSFC 468 NR ST ORBITER B6
(S2118S)	□	MSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 4.959

PARAMETRIC VALUES

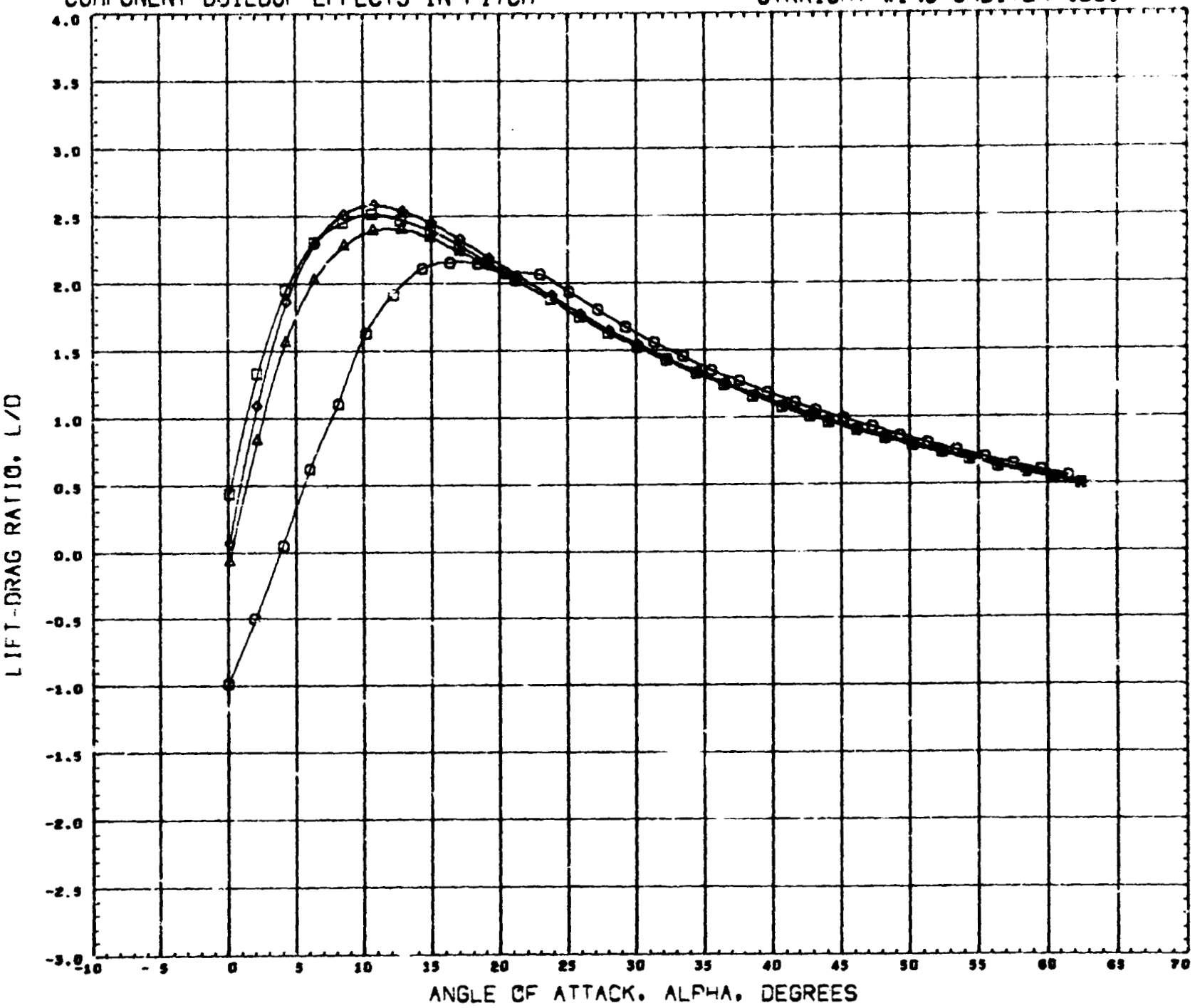
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S21178)	○	MSFC 460 NR ST ORBITER B6
(S21188)	□	MSFC 460 NR ST ORBITER B6W1O
(?21198)	◇	MSFC 460 NR ST ORBITER B6W1OH12
(VE120A)	△	MSFC460 NR ST ORBITER B6W1OH12V5

MACH 1.950

PARAMETRIC VALUES

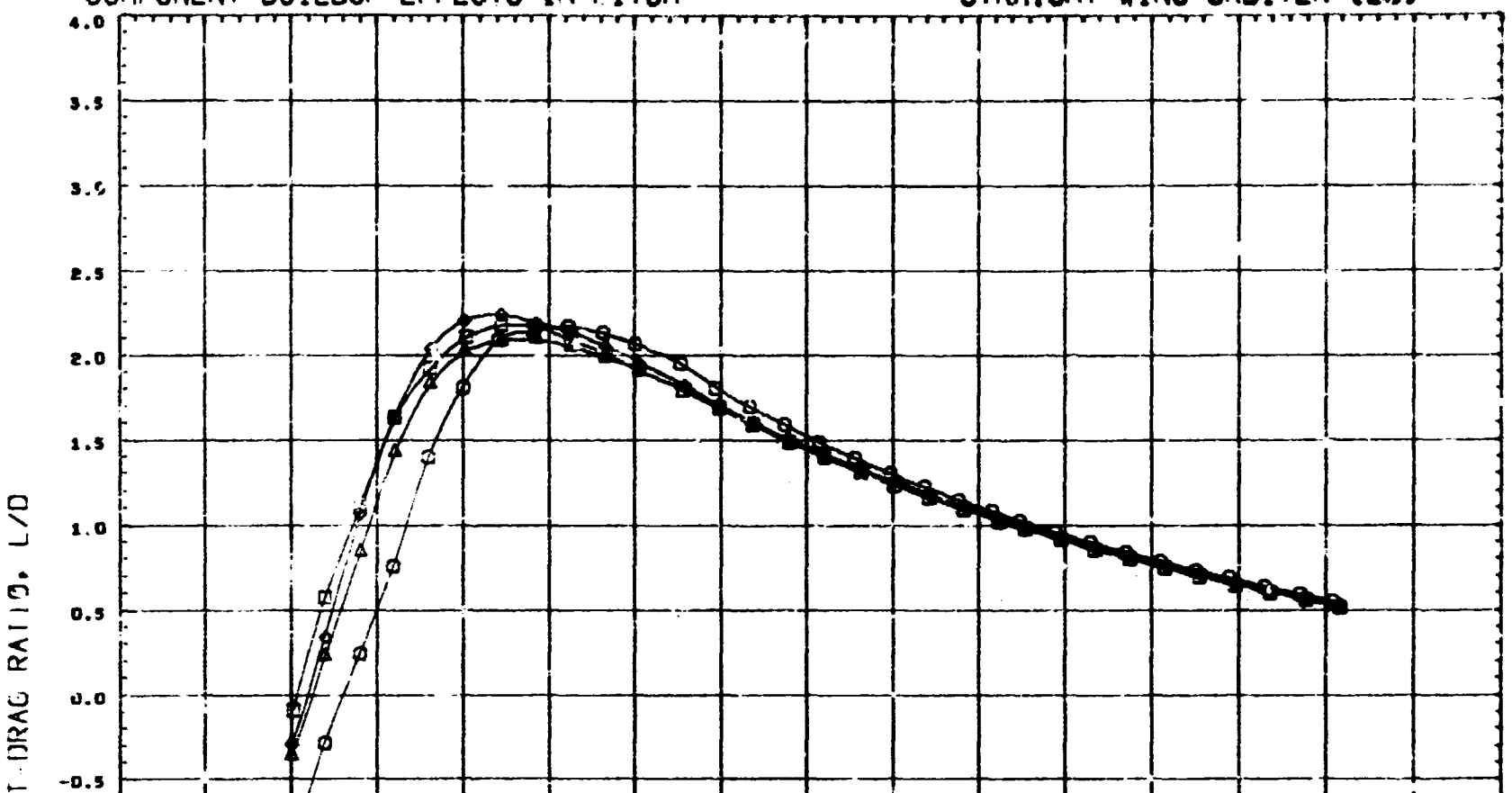
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.170	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	MSFC 468 NR ST ORBITER B6
(S2118S)	□	MSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 2.990

PARAMETRIC VALUES

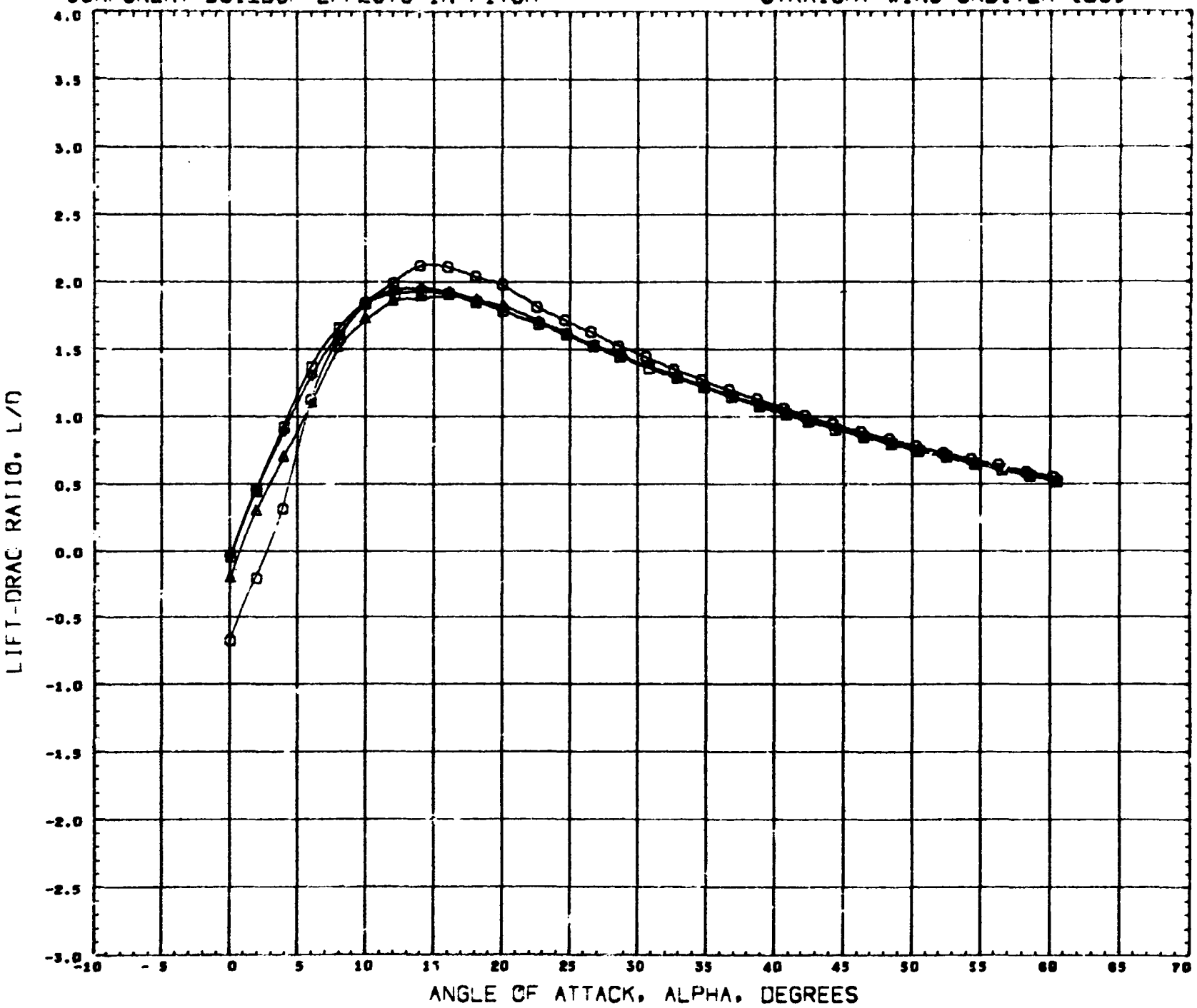
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRF	0.000	INCHES
ZMRP	- 0.170	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(821178)	○	NSFC 468 NR ST ORBITER B6
(821188)	□	NSFC 468 NR ST ORBITER B6W10
(821198)	◇	NSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	NSFC468 NR ST ORBITER B6W10H12V5

PARAMETRIC VALUES

BETA 0.000

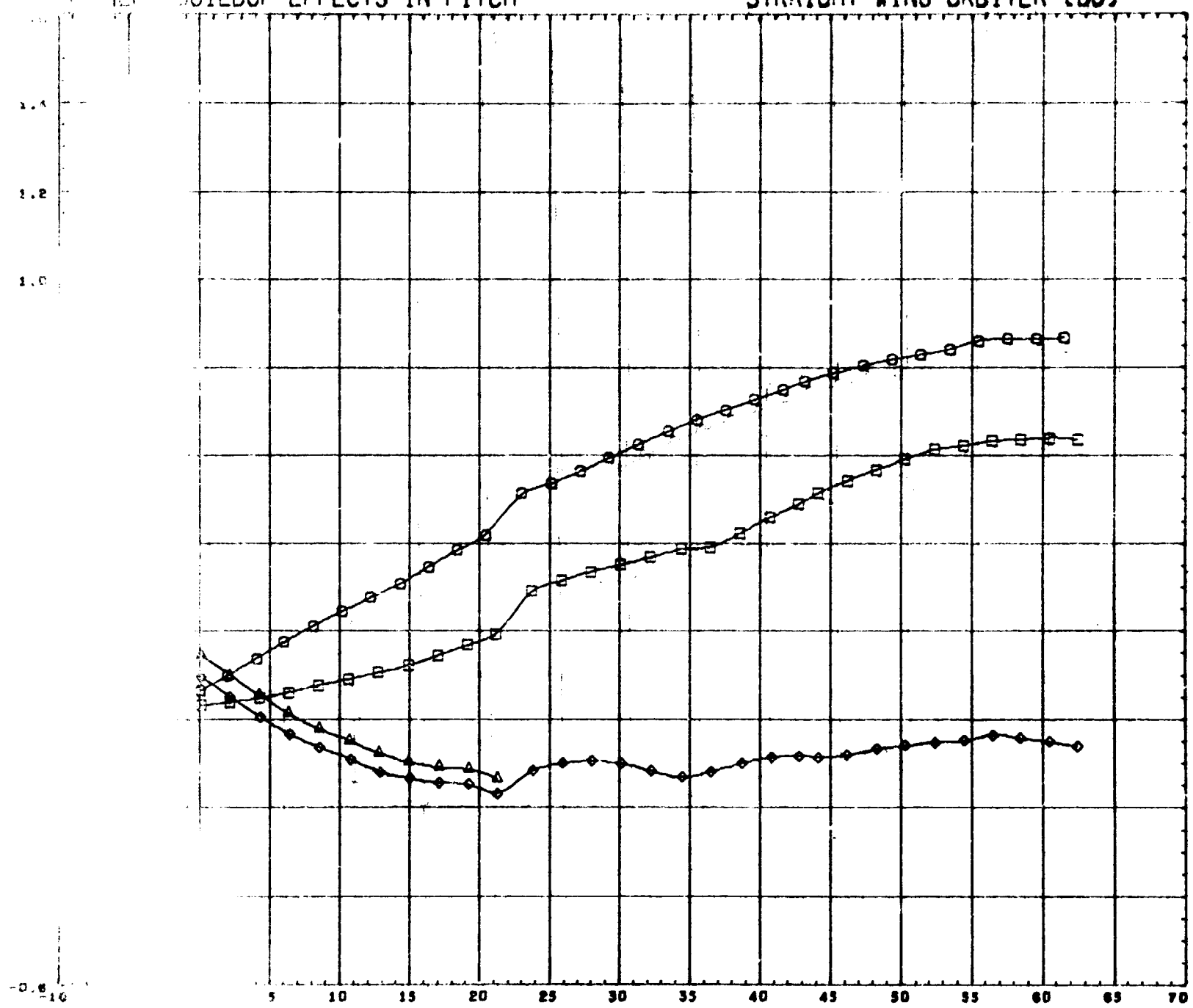
MACH 4.959

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.170	INCHES
SCALE	0.003	SCALE

BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)

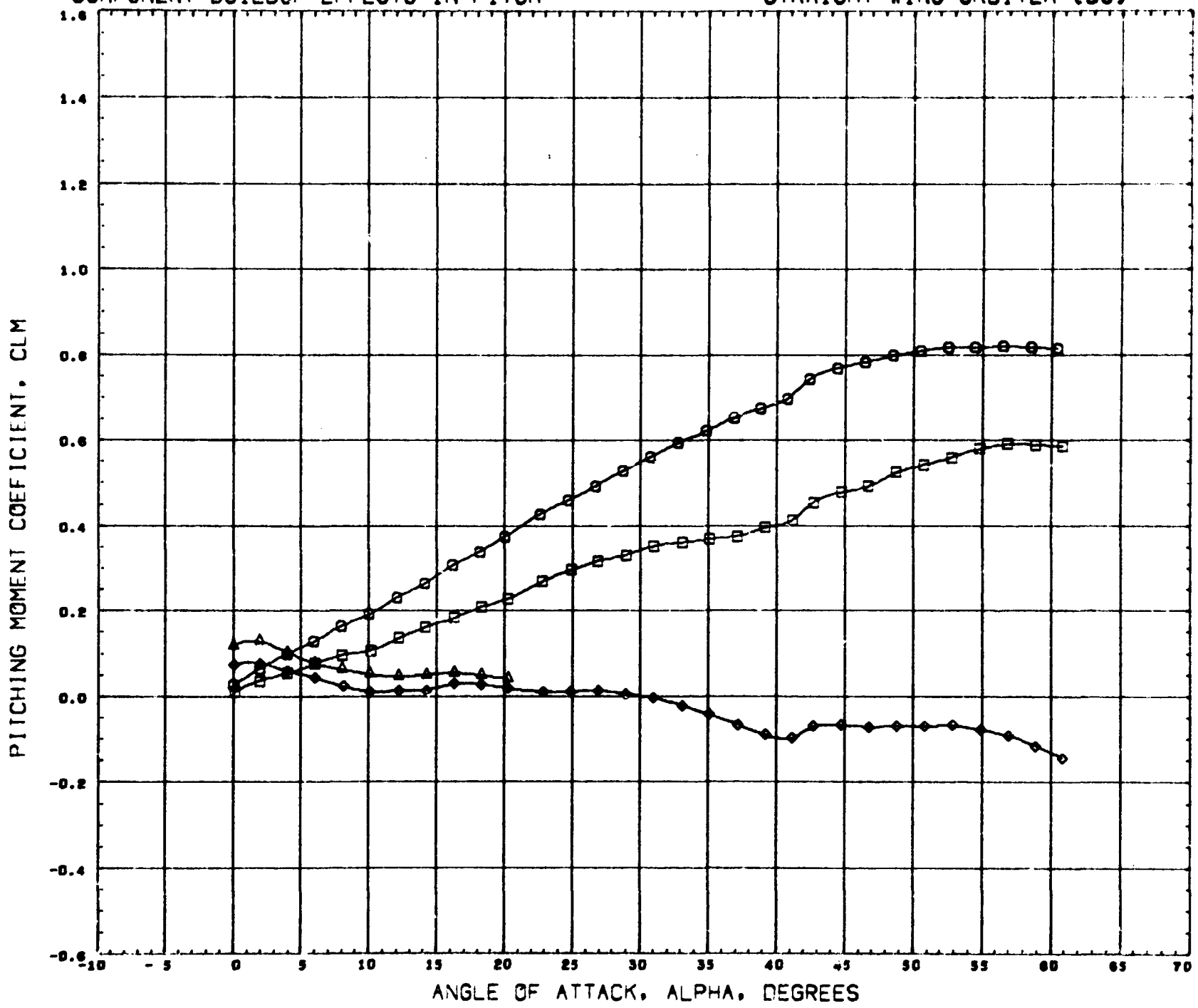


ANGLE OF ATTACK, ALPHA, DEGREES

DATA SET	SYMBOL	DESCRIPTION	PARAMETRIC VALUES		REFERENCE INFORMATION		
(S2117S)	□	ORBITER B6	BETA	0.000	REFS	5.440	SQINCH
(S2116S)	□	ORBITER B6W10			REFL	1.130	INCHES
(S2119S)	◇	ORBITER B6W10H12			REFB	5.215	INCHES
(V2120A)	△	ORBITER B6W10H12V5			XMRP	4.526	INCHES
					YMRP	0.000	INCHES
					ZMRP	-0.178	INCHES
					SCALE	0.003	SCALE

MACH

COMPONENT BUILDUP EFFECTS IN PITCH STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	MSFC 468 NR ST ORBITER B6
(S2118S)	□	MSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 2.990

PARAMETRIC VALUES

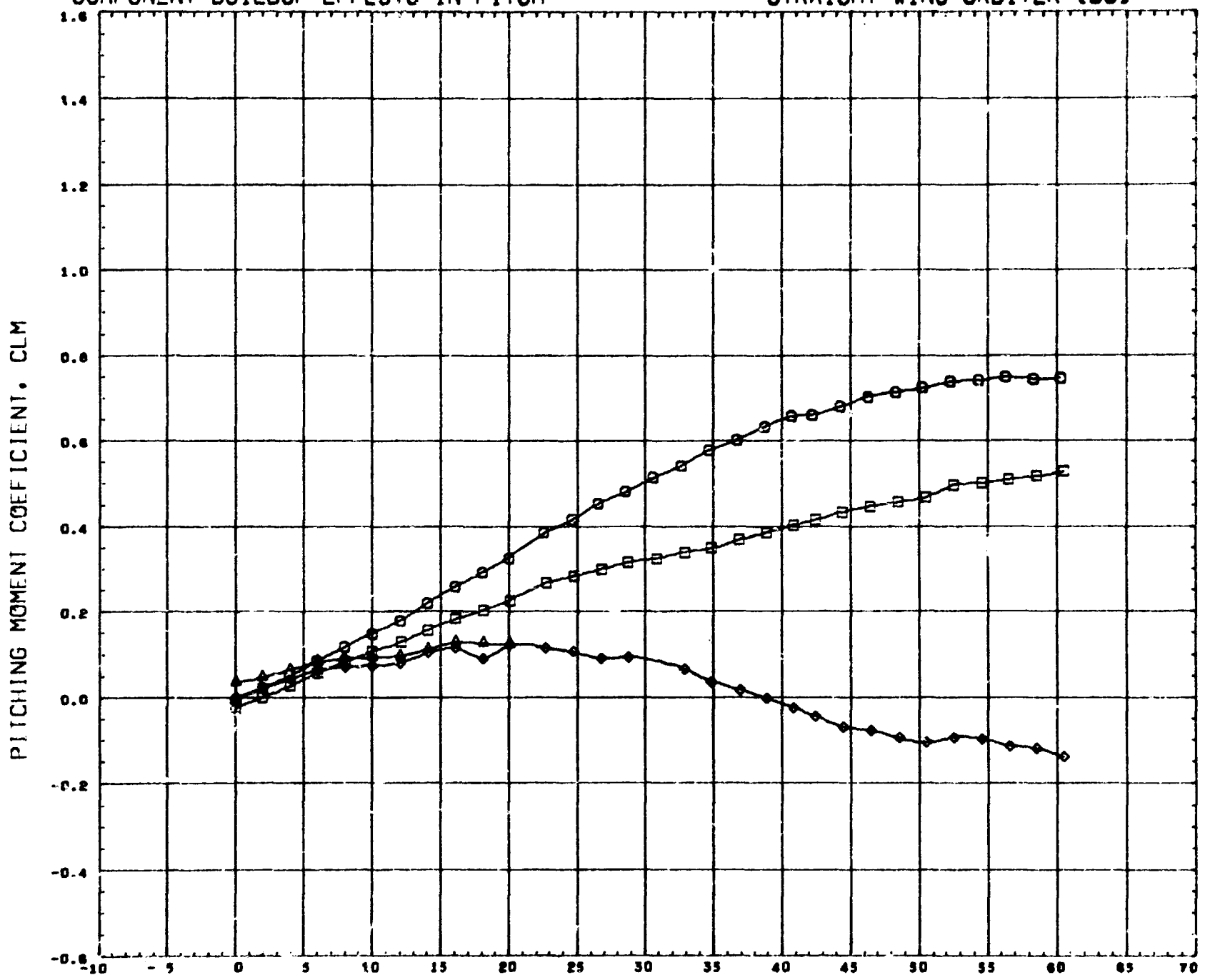
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S21175)	○	MSFC 466 NR ST ORBITER B6
(S21185)	□	MSFC 466 NR ST ORBITER B6W10
(S21195)	◇	MSFC 466 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC466 NR ST ORBITER B6W10H12V5

MACH 4.959

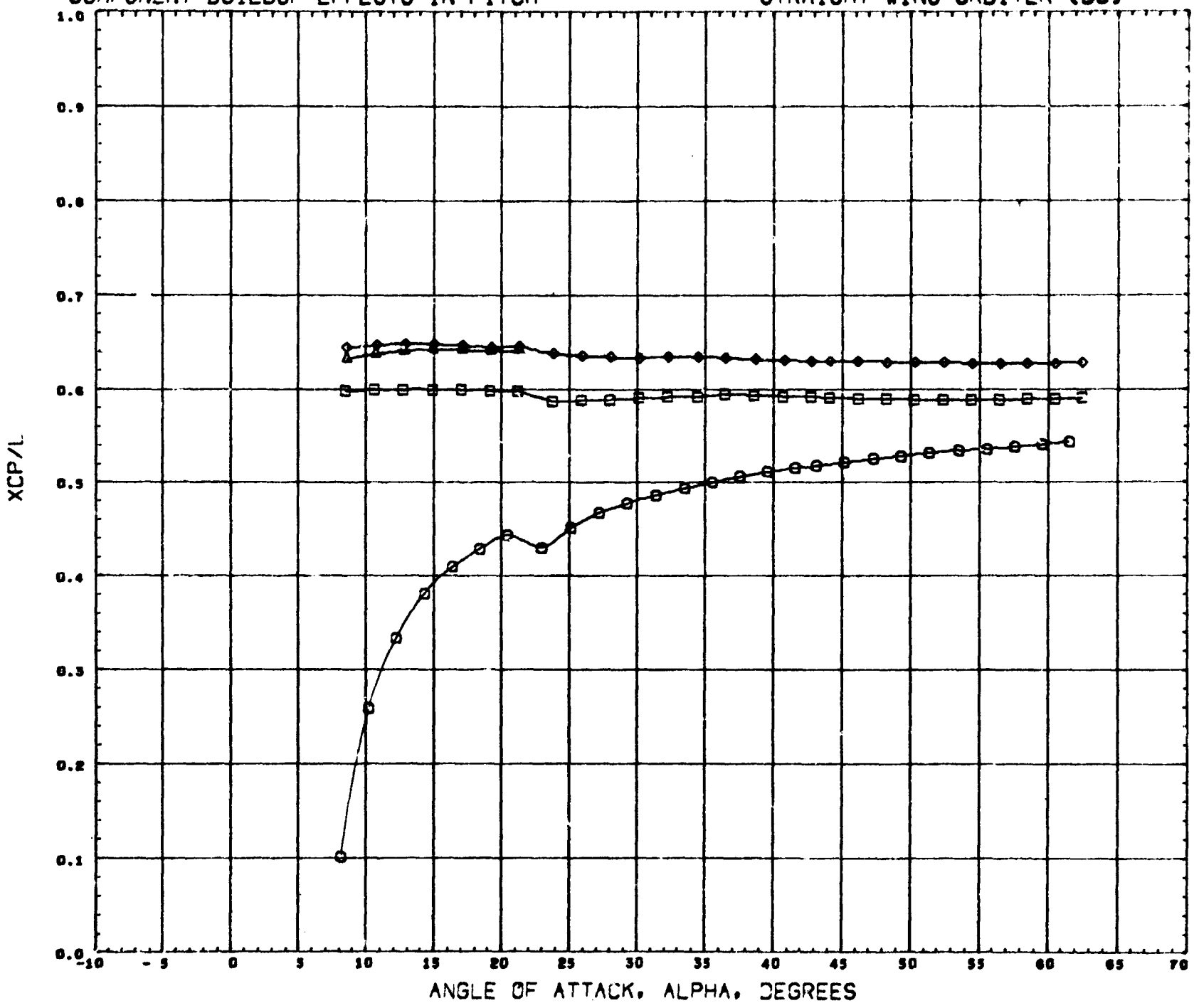
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP -	0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(F21178)	○	MSFC 468 NR ST ORBITER B6
(F21188)	□	MSFC 468 NR ST ORBITER B6W10
(F2119B)	◇	MSFC 468 NR ST ORBITER B6W10H12
(F2120A)	△	MSFC 468 NR ST ORBITER B6W10H12V5

PARAMETRIC VALUES

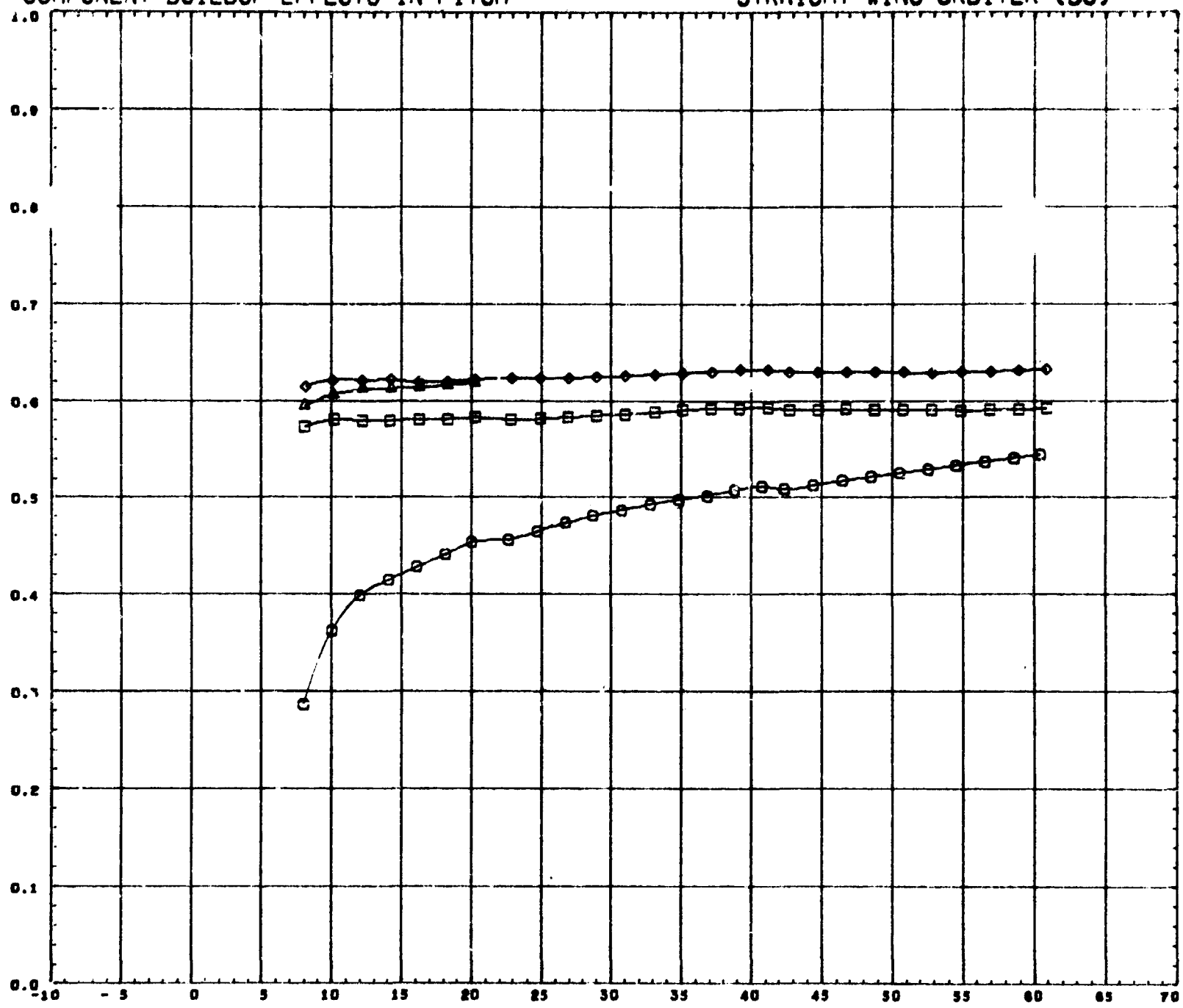
BETA 0.000

MACH 1.950

REFERENCE INFORMATION		
REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(F2117S)	○	MSFC 468 NR ST ORBITER B6
(F2118S)	□	MSFC 468 NR ST ORBITER B6W10
(F2119S)	◇	MSFC 468 NR ST ORBITER B6W10H12
(F2120A)	△	MSFC 468 NR ST ORBITER B6W10H12V5

MACH 2.990

PARAMETRIC VALUES

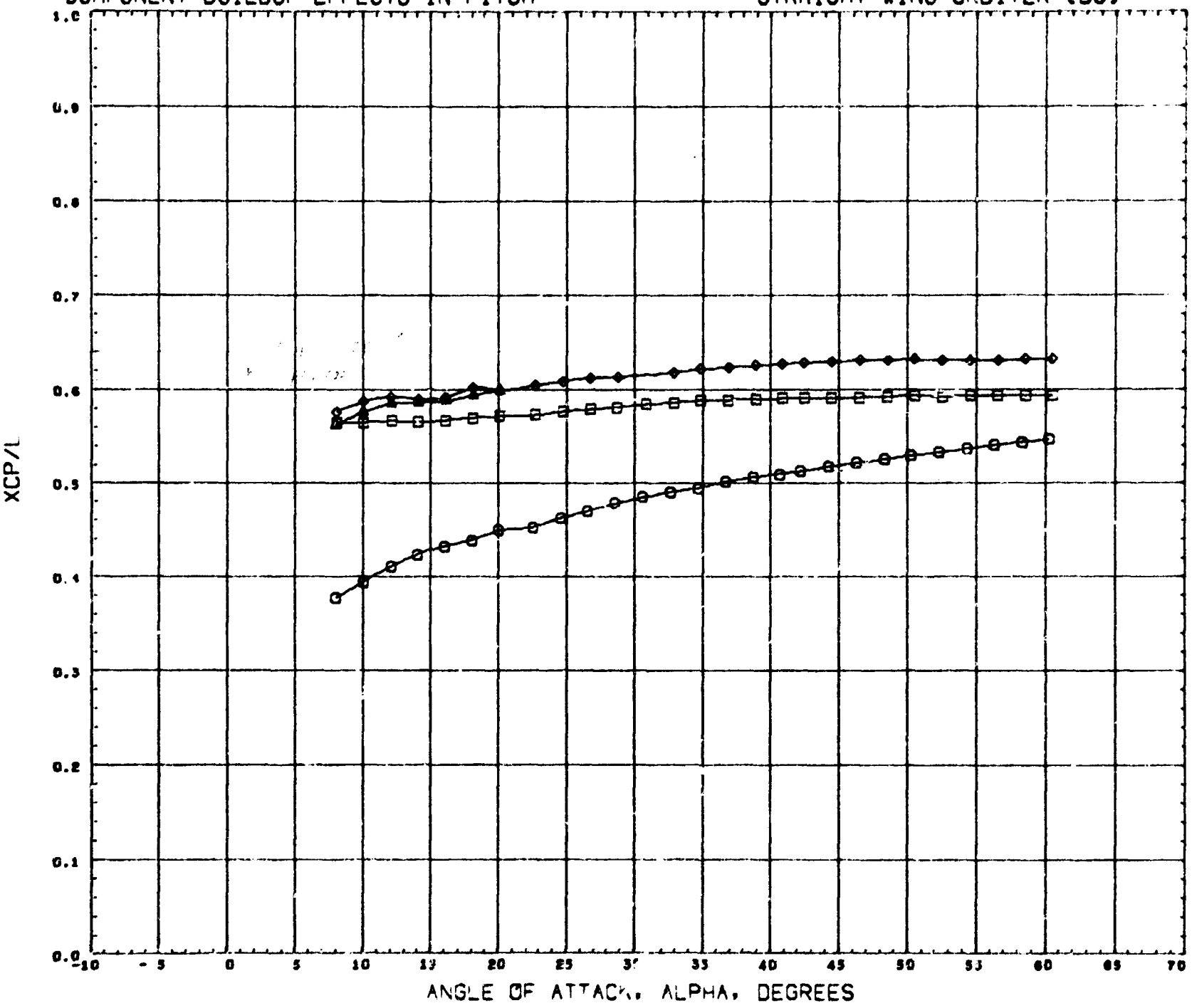
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	2.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(F2117S)	○	MSFC 468 NR ST ORBITER B6
(F2118S)	□	MSFC 468 NR ST ORBITER B6W10
(F2119S)	◇	MSFC 468 NR ST ORBITER B6W10H12
(F2120A)	△	MSFC 468 NR ST ORBITER B6W10H12V3

MACH 4.959

PARAMETRIC VALUES

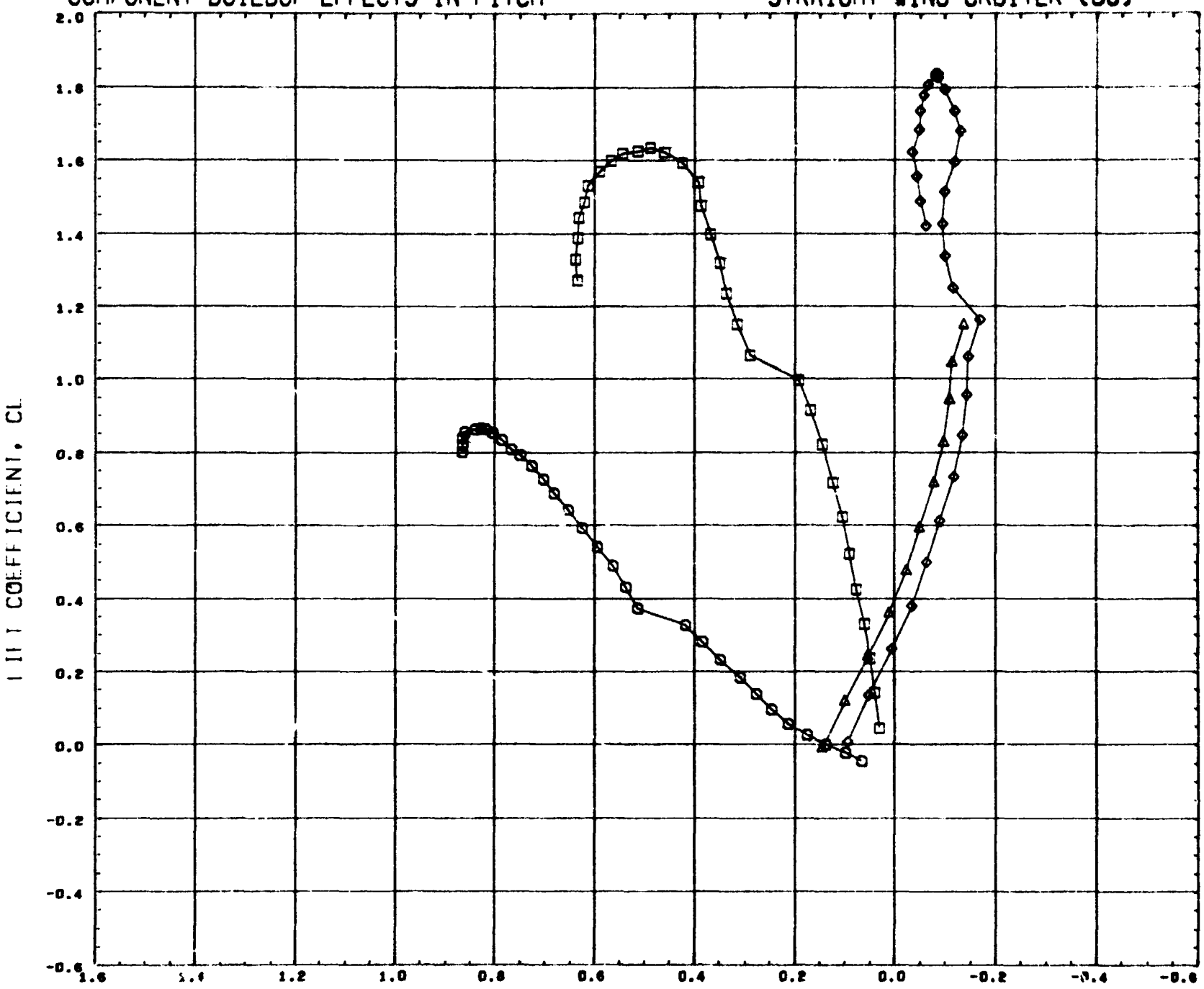
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	MSFC 468 NR ST ORBITER B6
(S2118S)	□	MSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120M)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 1.958

PARAMETRIC VALUES

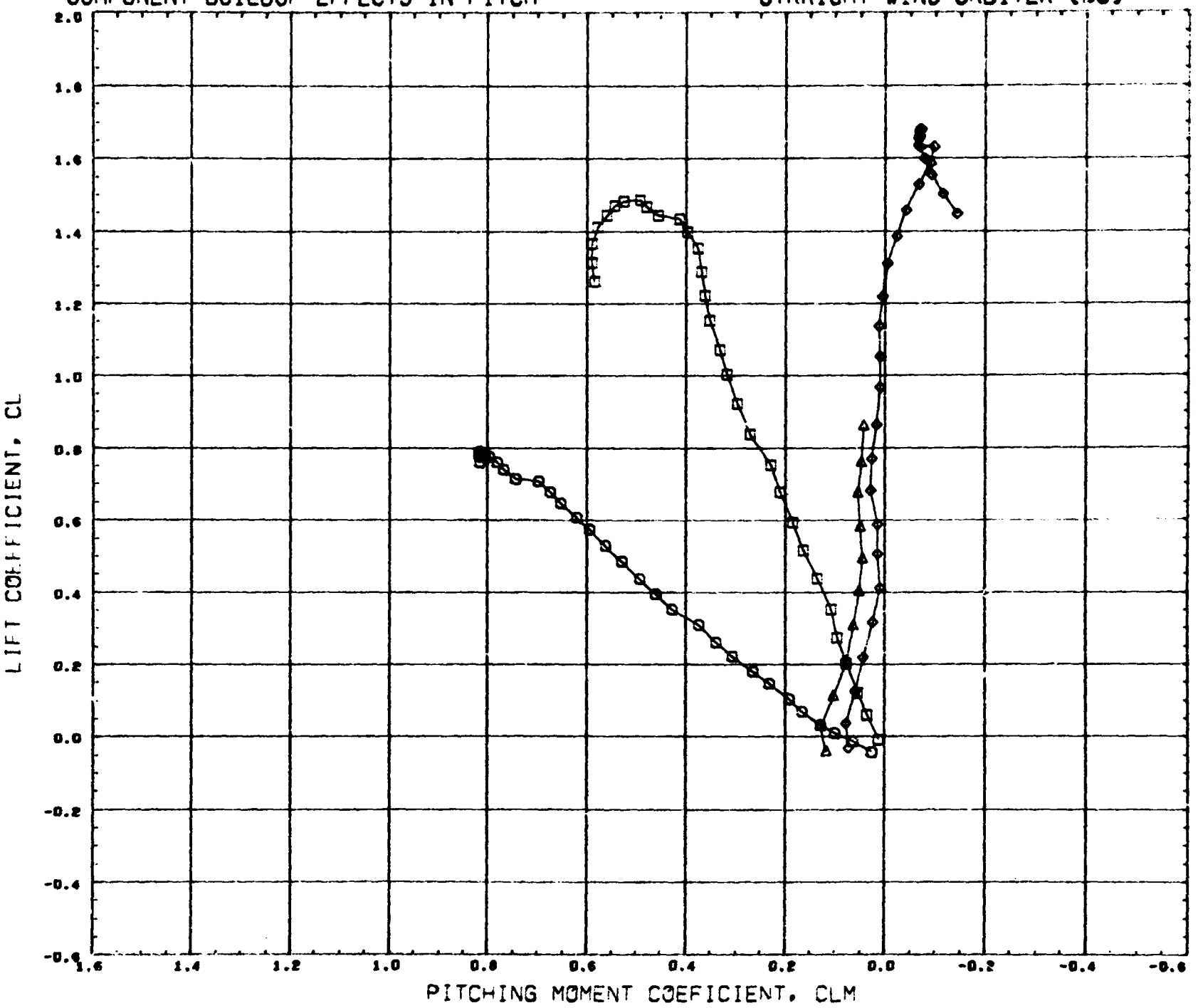
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	MSFC 468 NR ST ORBITER B6
(S2118S)	□	MSFC 468 NR ST ORBITER B6W1D
(S2119S)	◇	MSFC 468 NR ST ORBITER B6W1DH12
(V2120A)	△	MSFC468 NR ST ORBITER B6W1DH12V5

MACH 2.990

PARAMETRIC VALUES

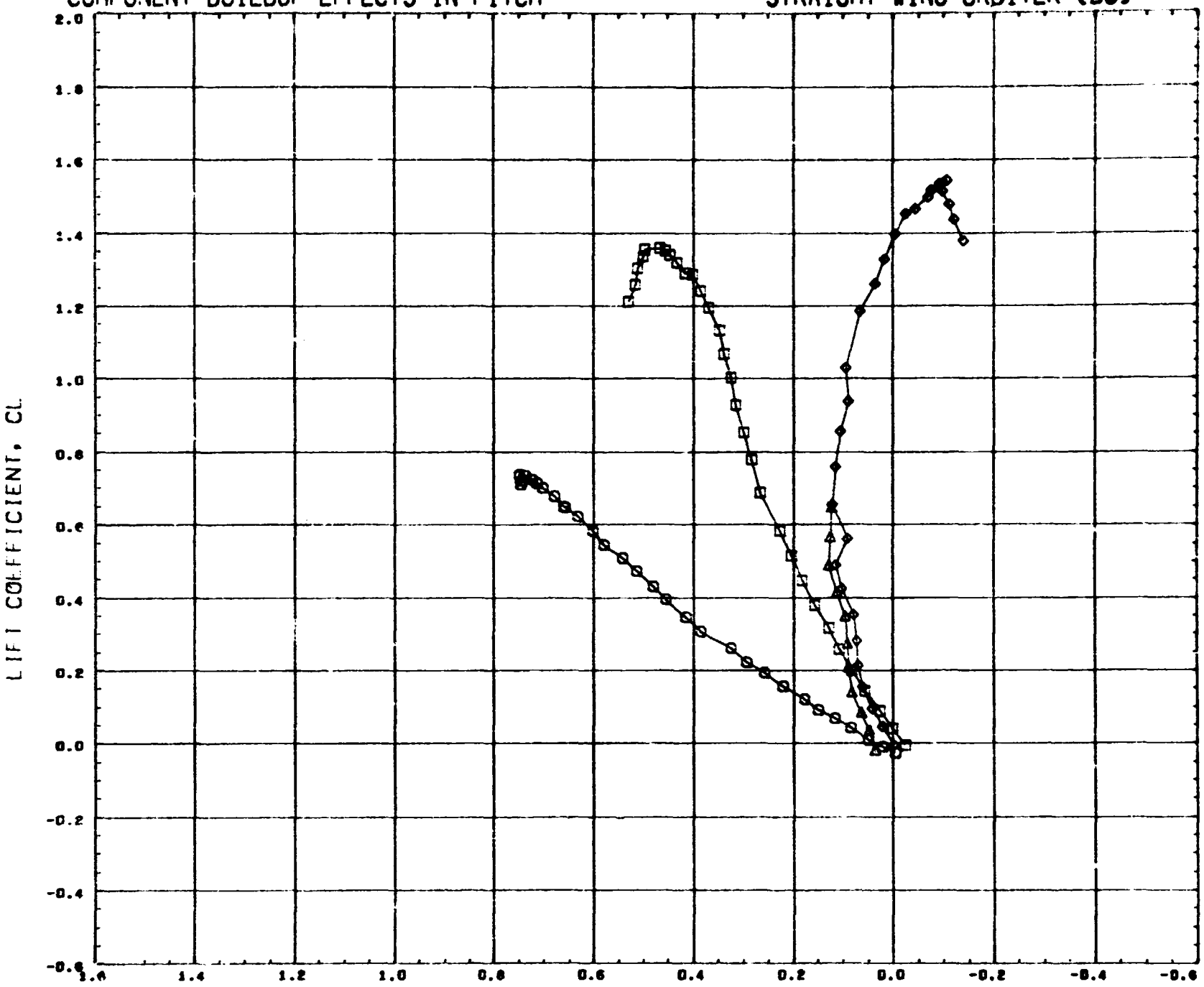
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	MSFC 468 NR ST ORBITER B6
(S2118S)	□	MSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 4.959

PARAMETRIC VALUES

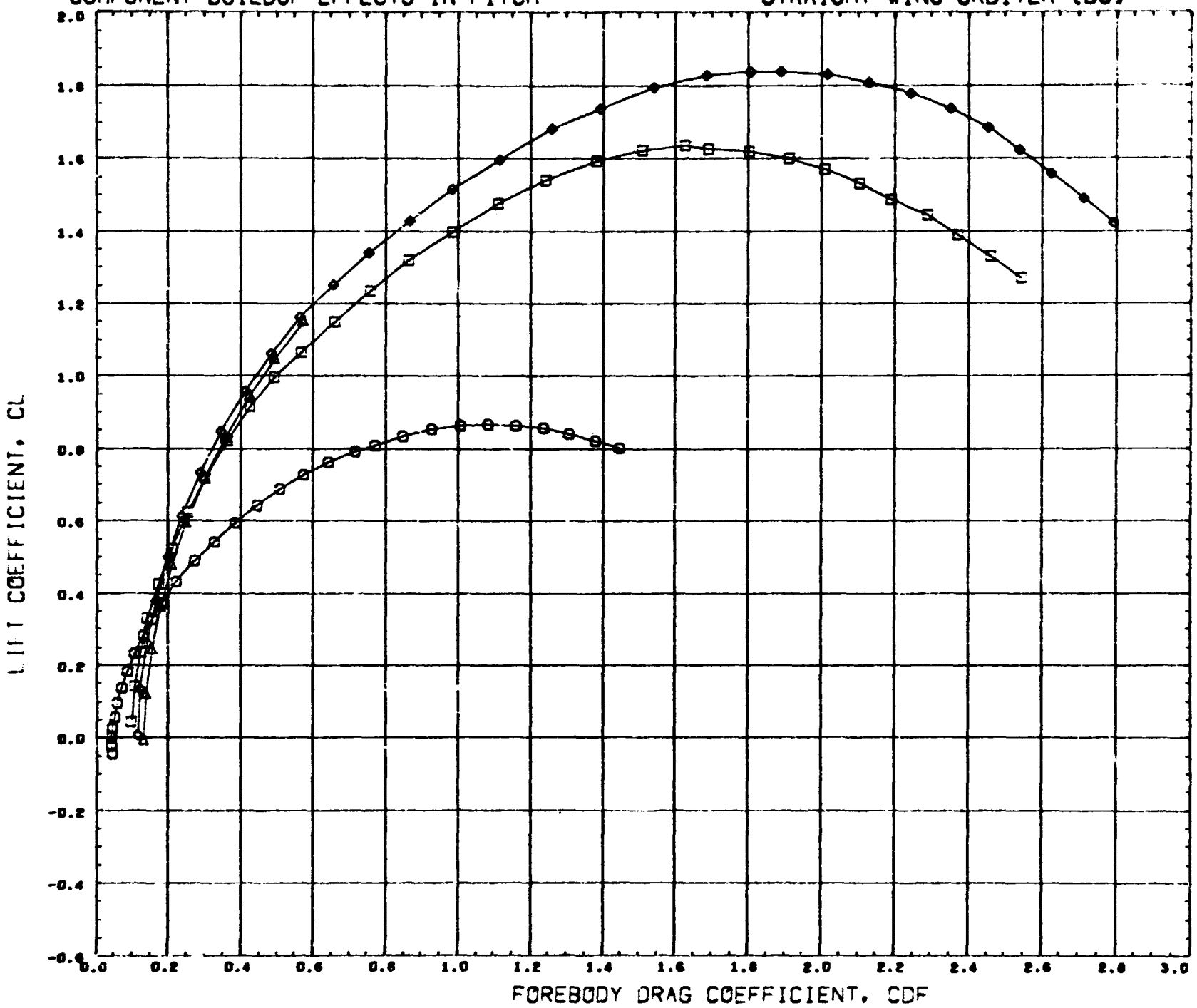
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	MSFC 468 NR ST ORBITER B6
(S2118S)	□	MSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 1.958

PARAMETRIC VALUES

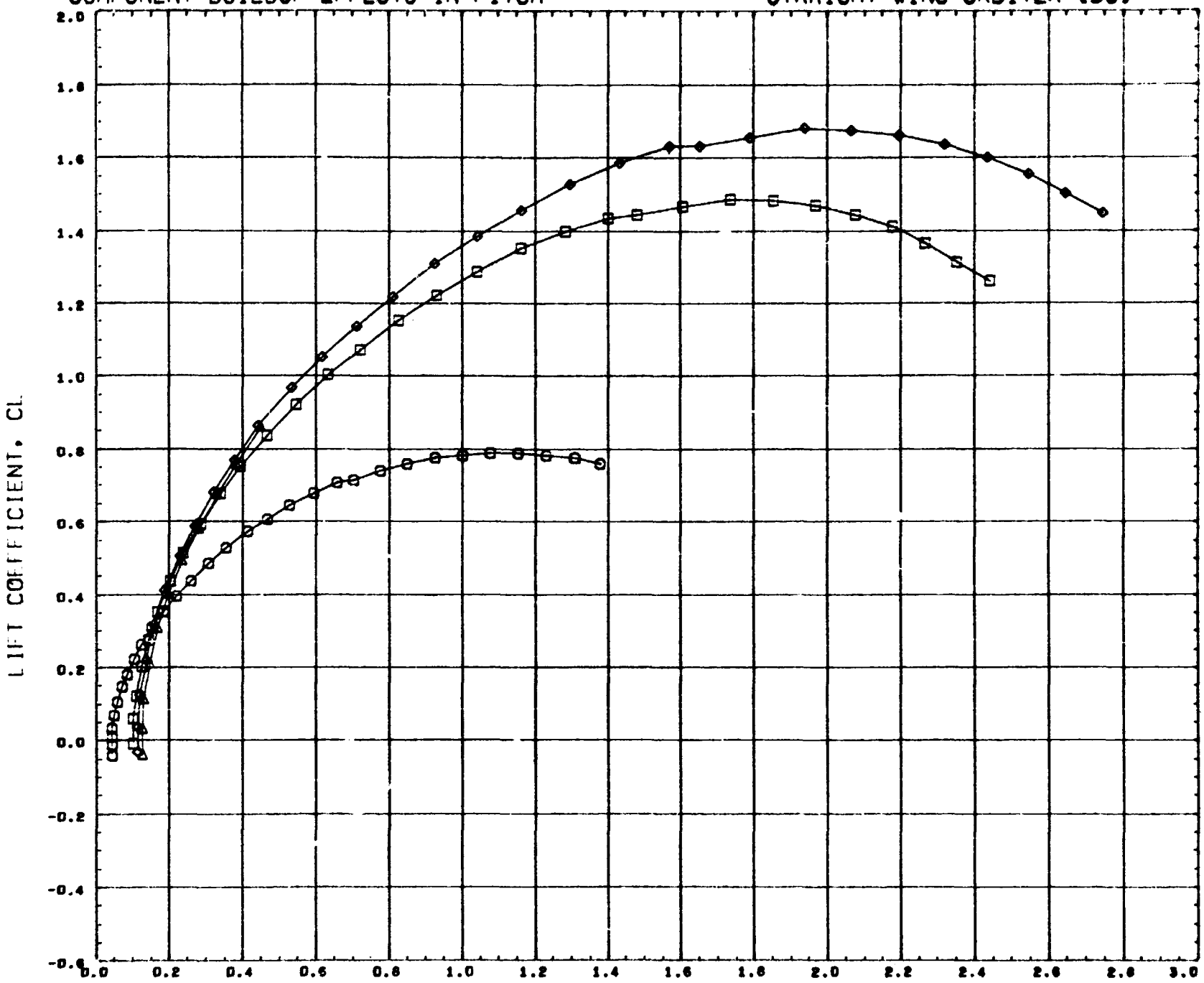
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	□	MSFC 468 NR ST ORBITER B6
(S2118S)	⊏	MSFC 468 NR ST ORBITER B6W10
(S2119S)	◇	MSFC 468 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 2.990

PARAMETRIC VALUES

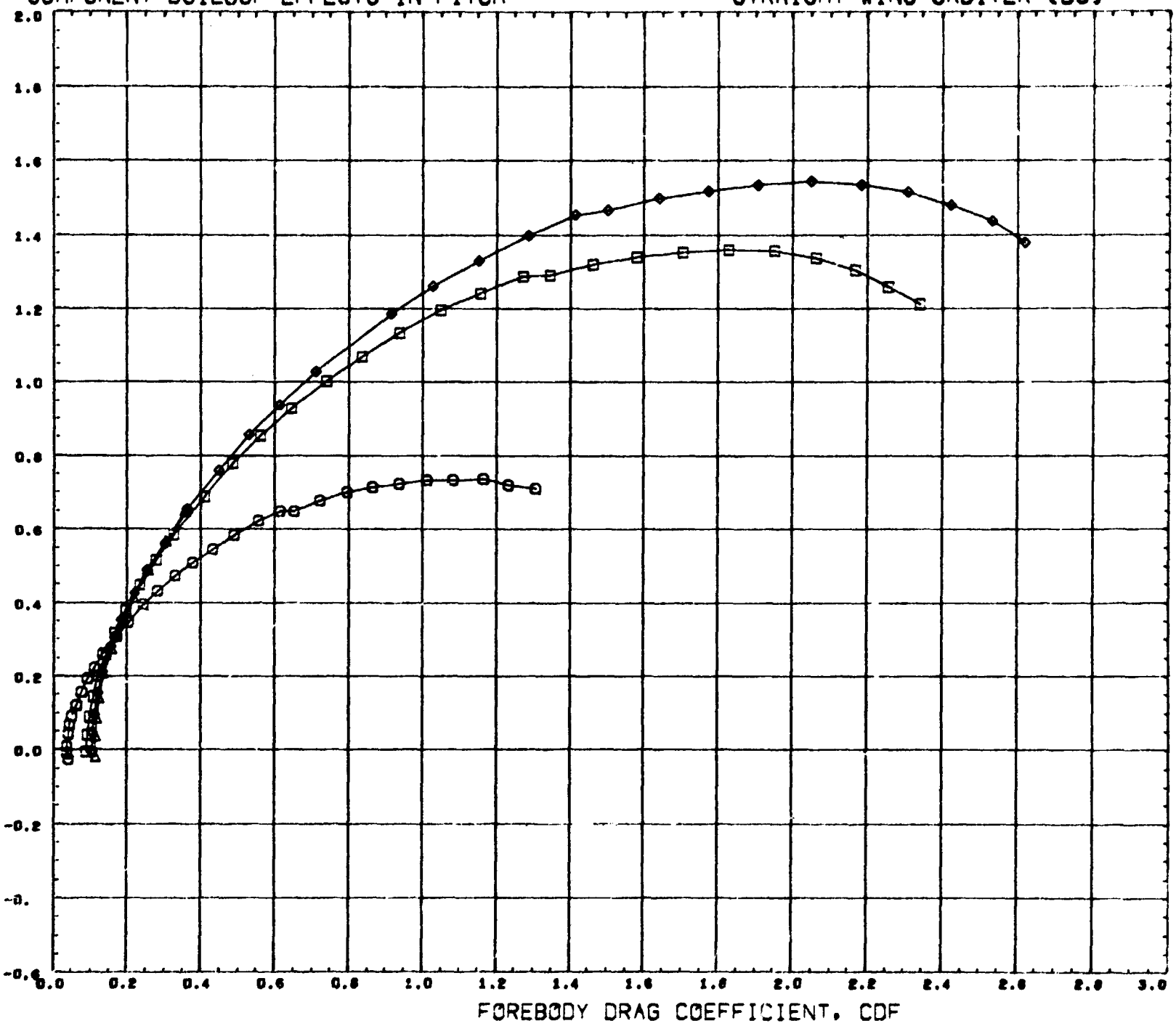
BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

STRAIGHT WING ORBITER (B6)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2117S)	○	MSFC 466 NR ST ORBITER B6
(S2118S)	□	MSFC 466 NR ST ORBITER B6W10
(S2119S)	◇	MSFC 466 NR ST ORBITER B6W10H12
(V2120A)	△	MSFC466 NR ST ORBITER B6W10H12V5

MACH 4.959

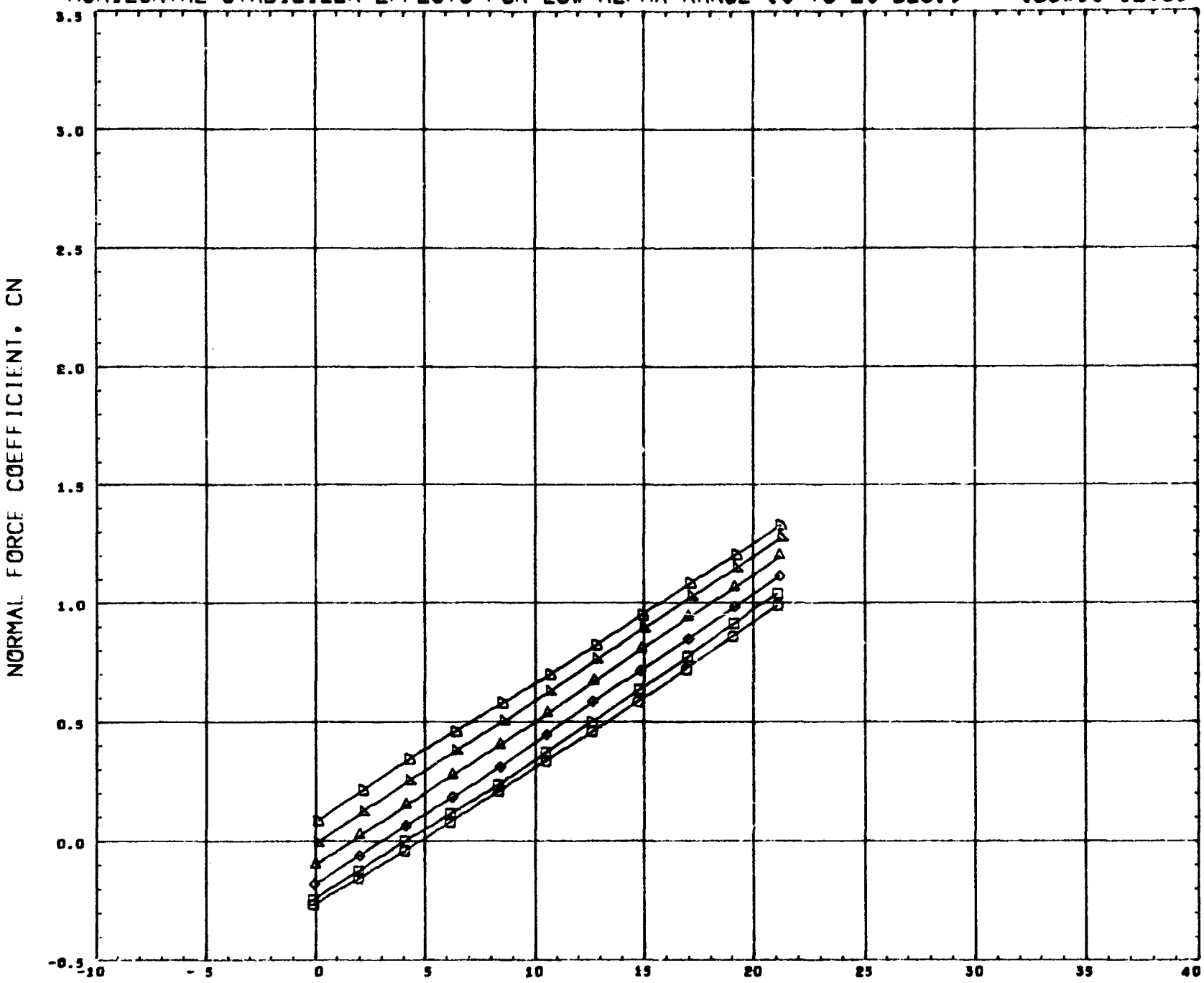
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

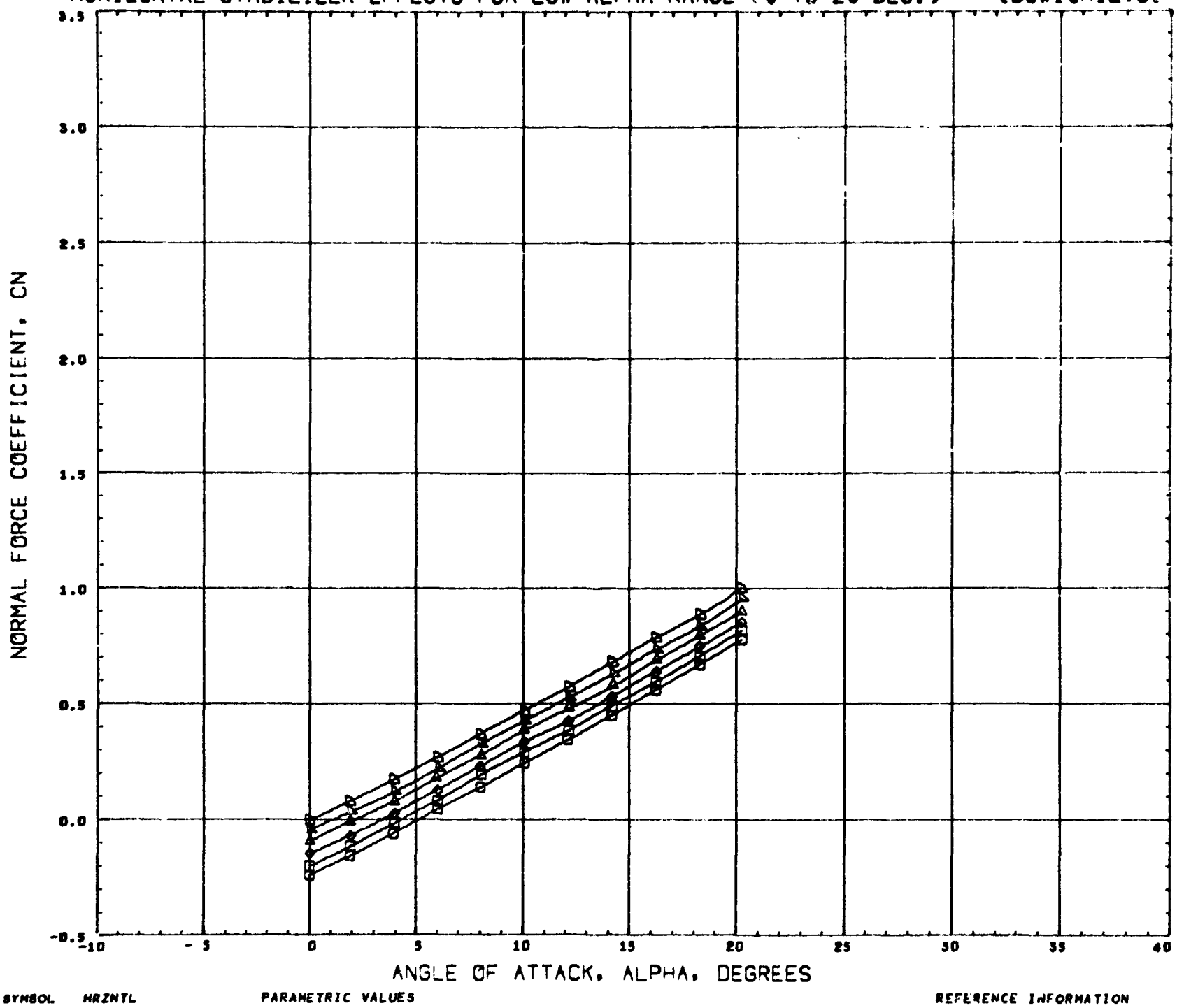
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	1.958	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▷	0.000				
⊃	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

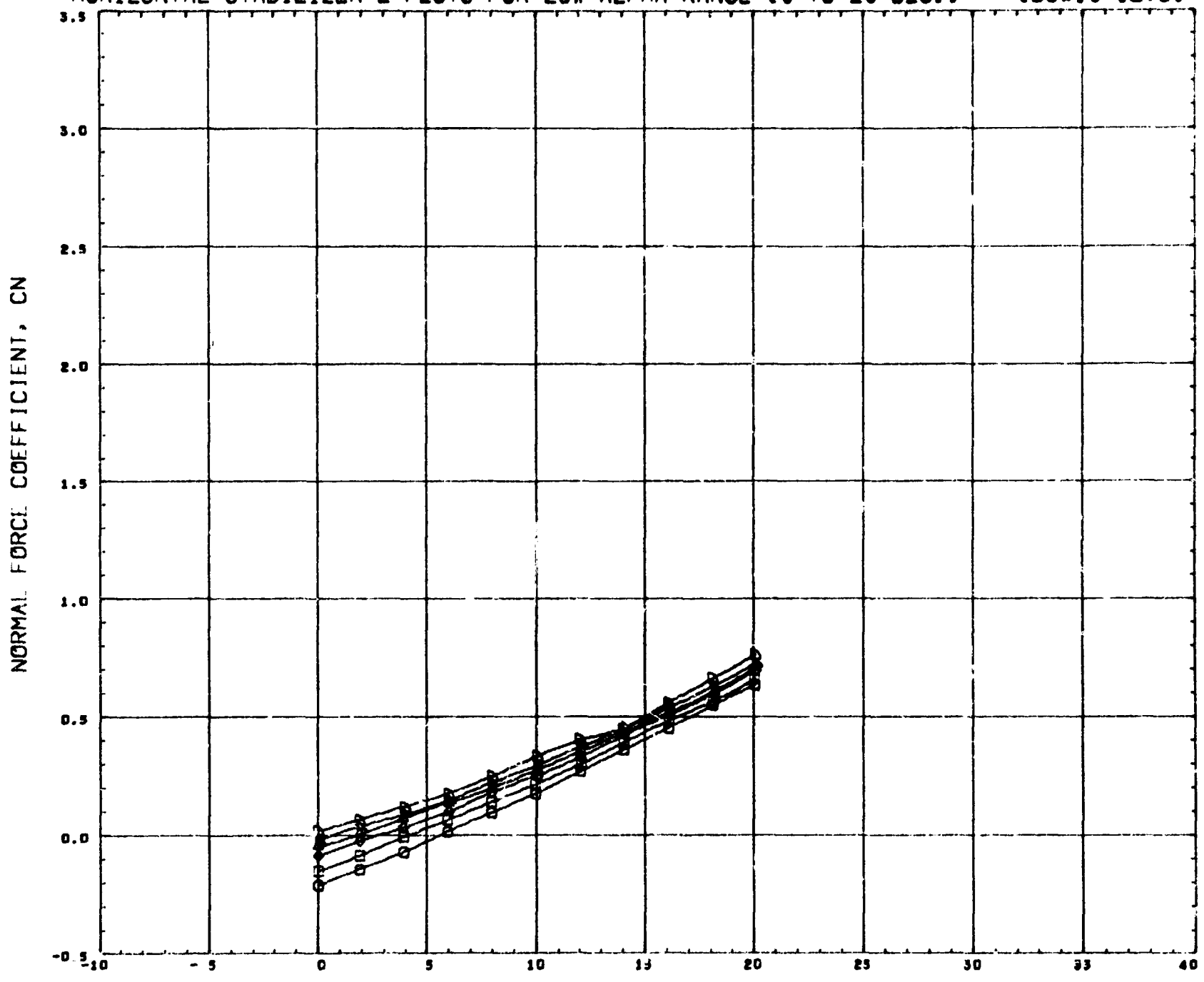
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
O	- 40.000	MACH	2.990	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▷	0.000				
D	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

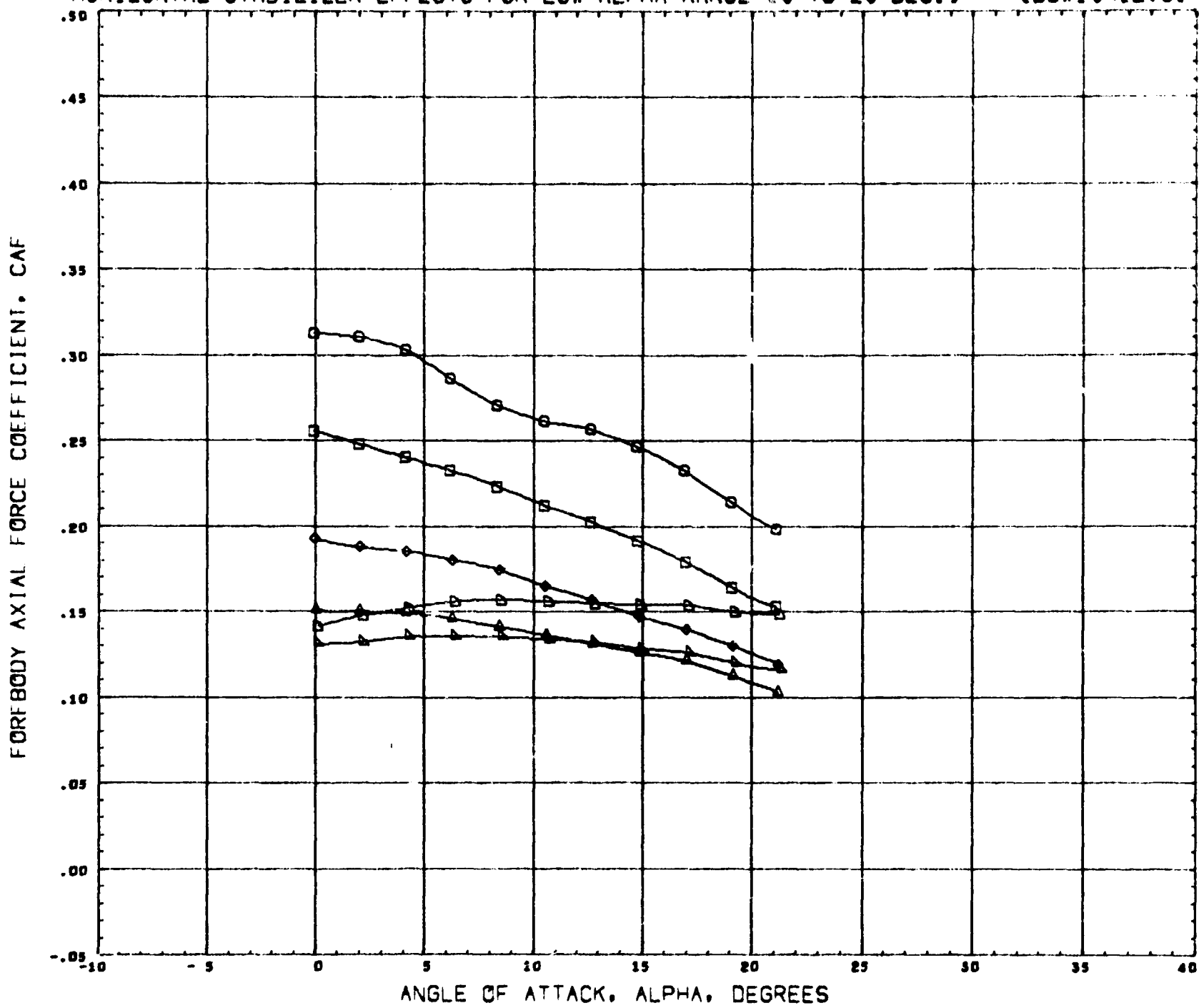
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	4.959	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▽	0.000				
D	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

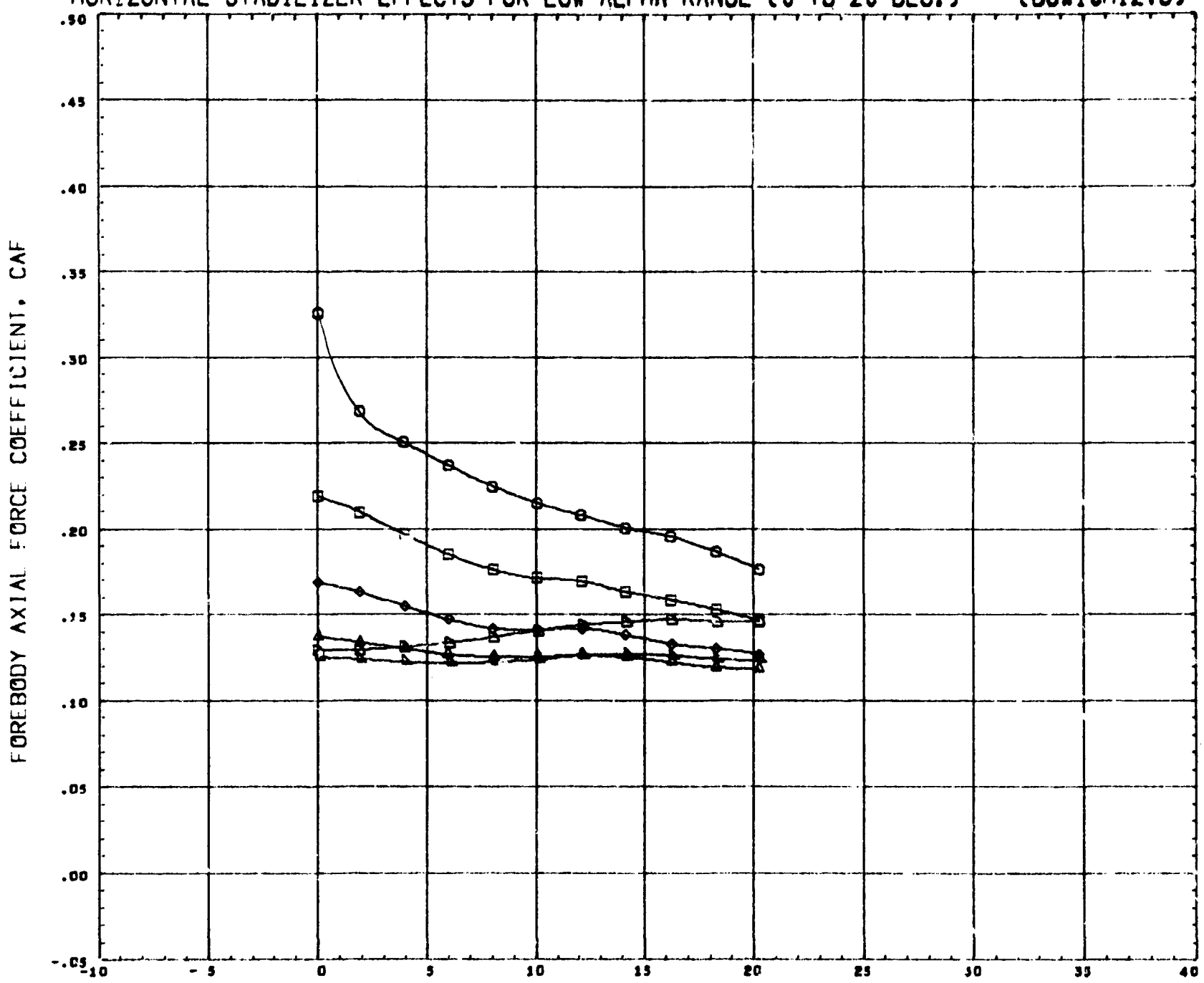
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES			
○	- 40.000	MACH	1.958	BETA	0.000	
□	- 30.000					
◇	- 20.000					
△	- 10.000					
▷	0.000					
▽	10.000	REFERENCE FILE	NA 70 446			

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
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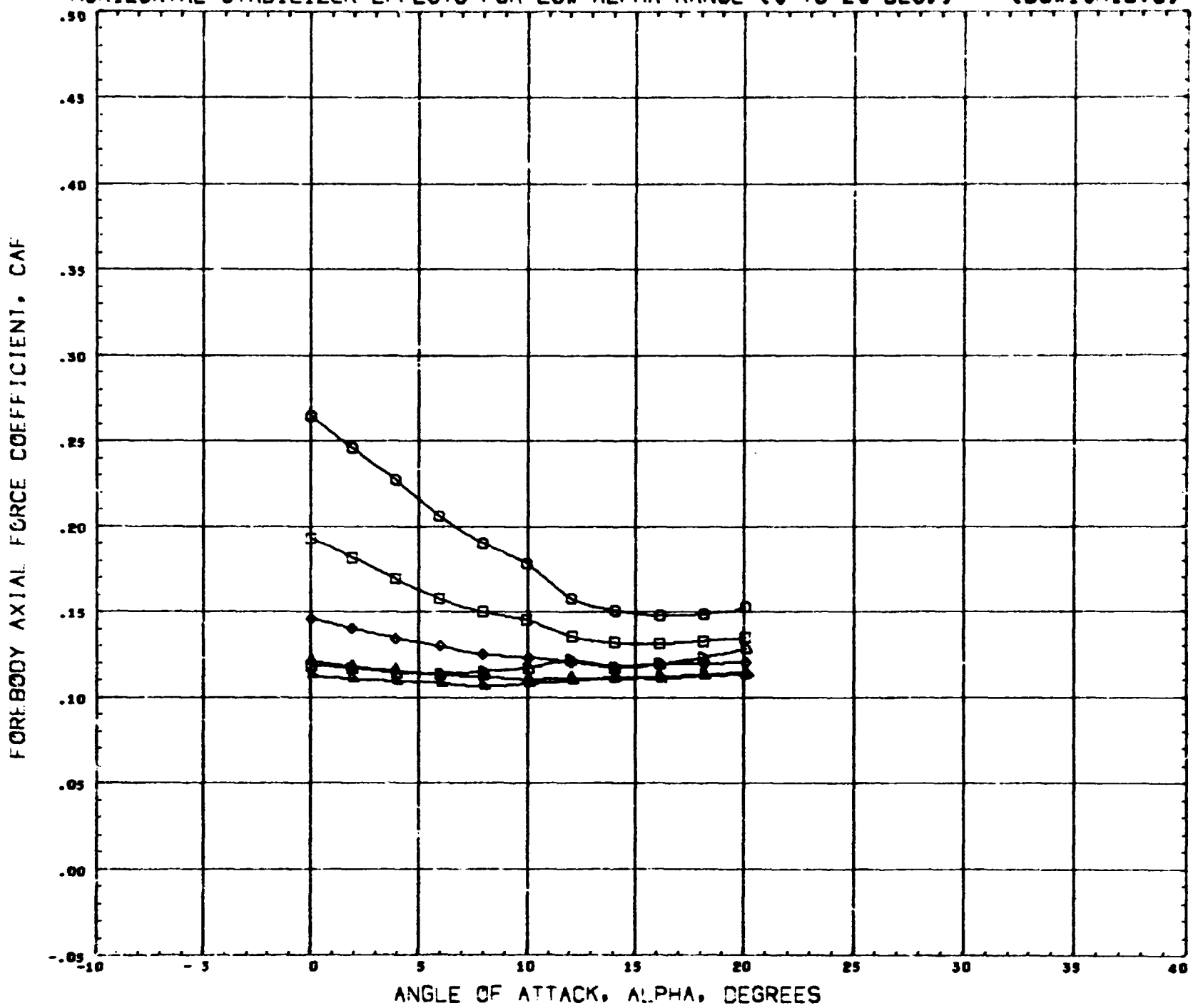
□	- 30.000				
◇	- 20.000				
△	- 10.000				
↘	0.000				
ↄ	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

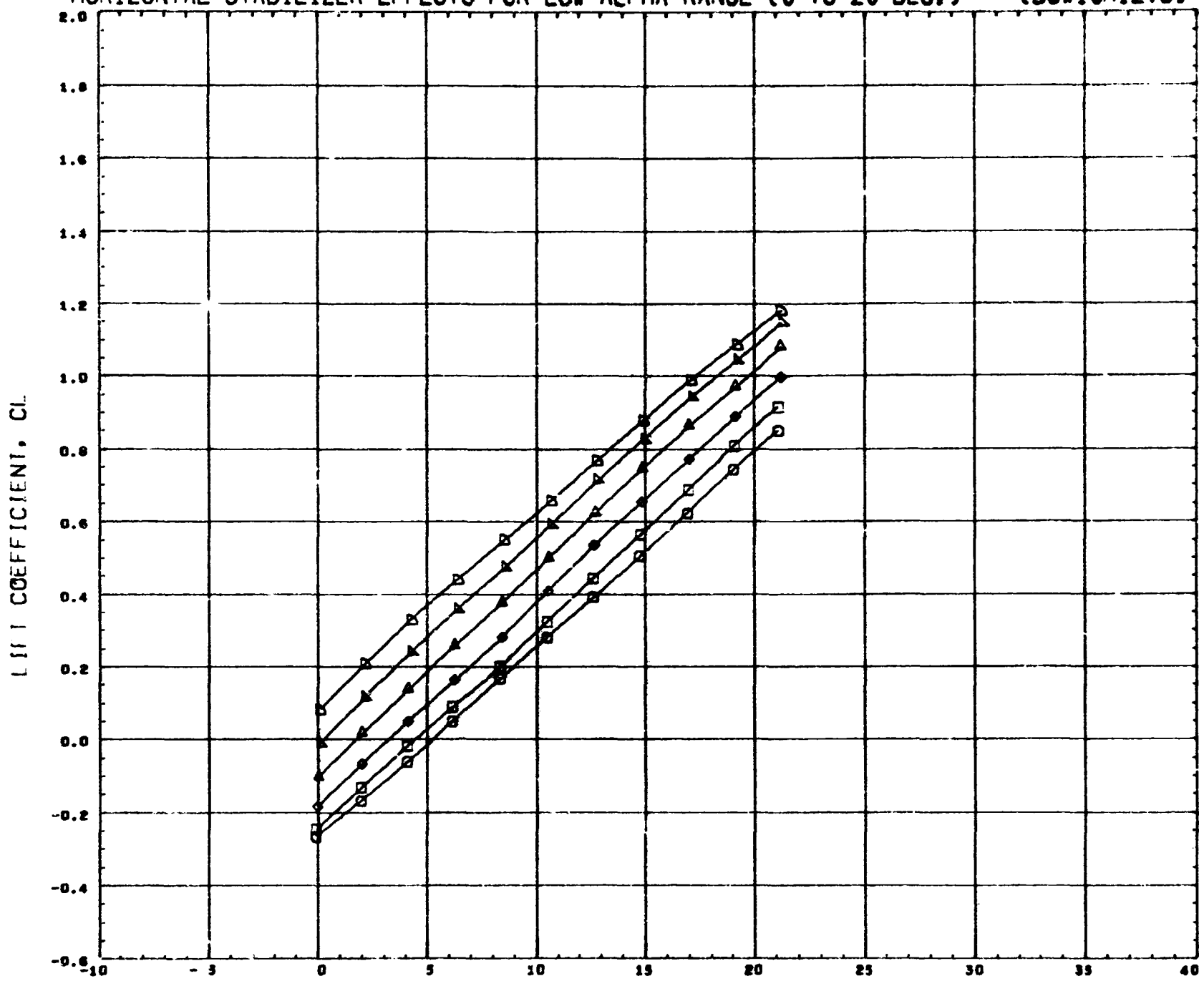
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
□	- 40.000	MACH	4.959	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▷	0.000				
○	10.000	REFERENCE FILE	MA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

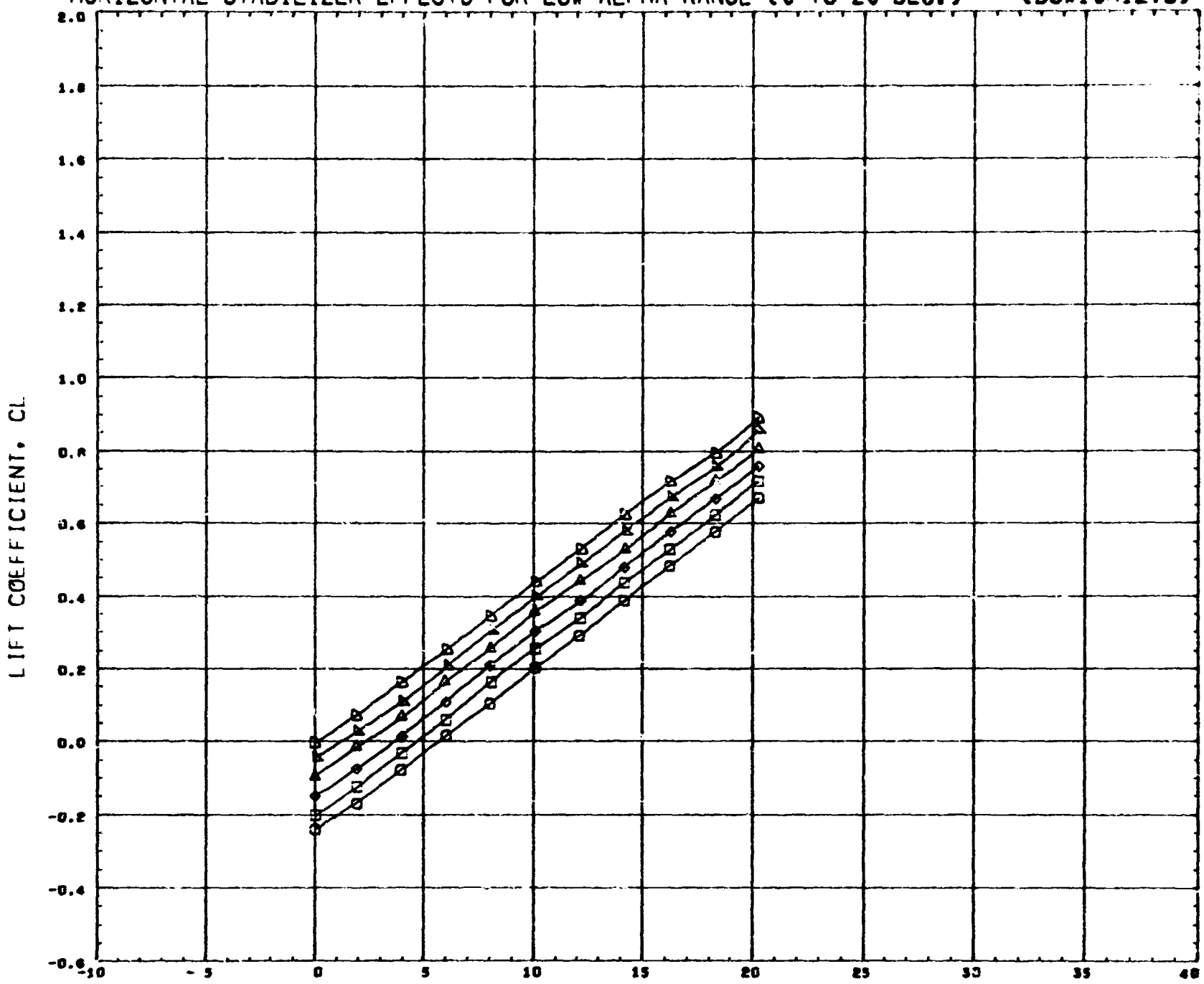
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	1.938	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▷	0.000				
▷	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4408	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

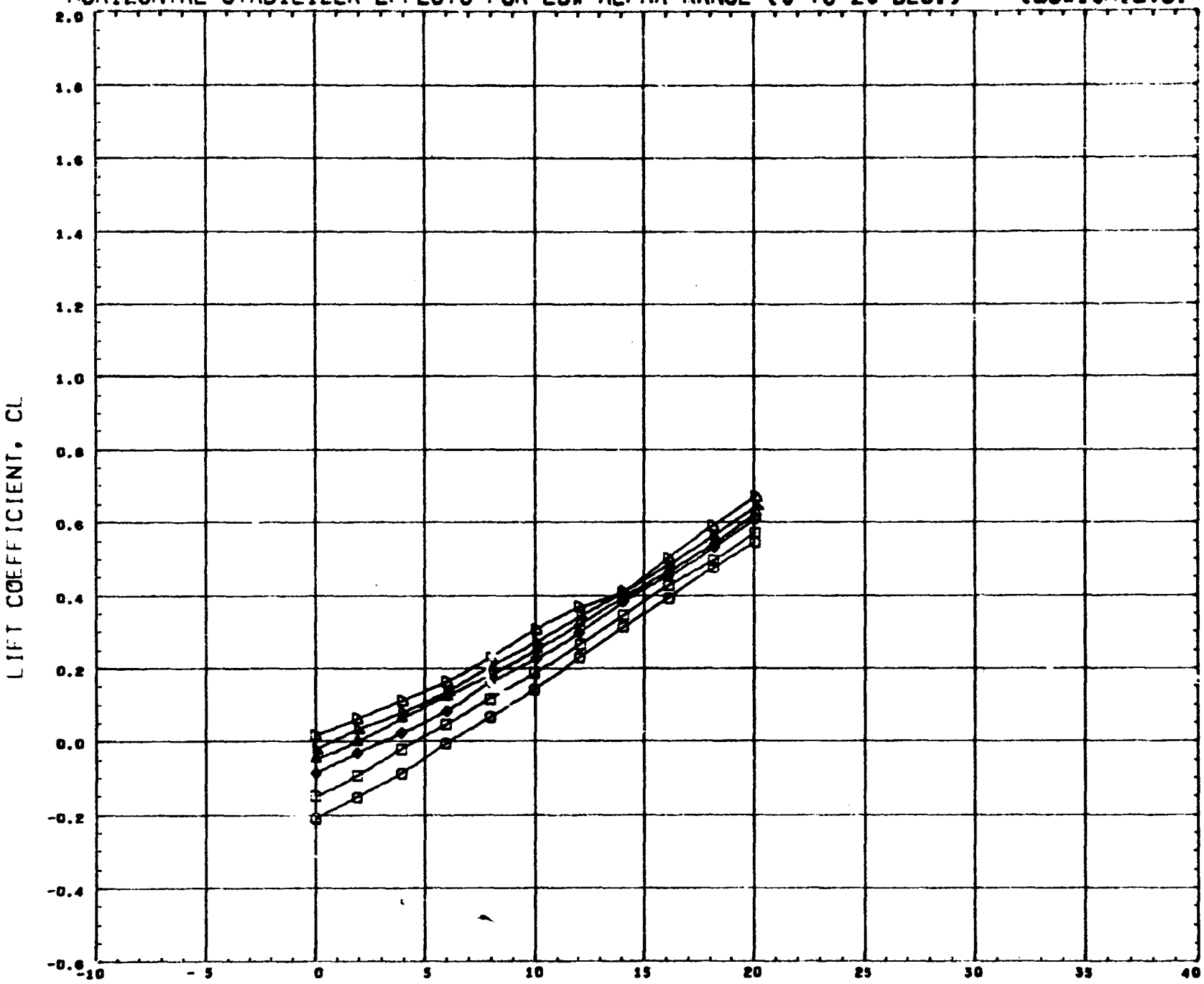
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	2.990	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▽	0.000				
⬭	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

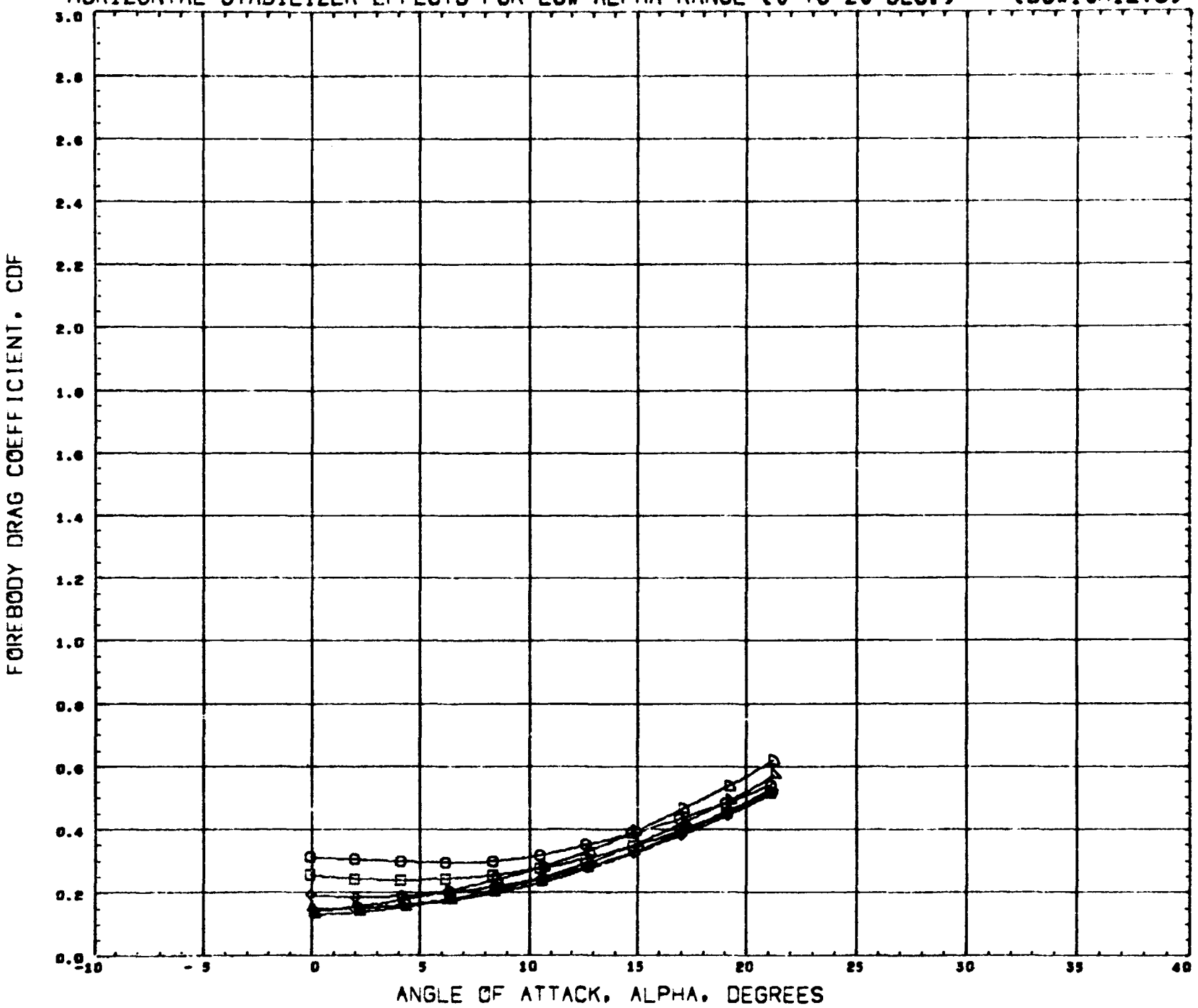
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	4.959	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▲	0.000				
▷	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4[illegible]0	SQINCH
REFL	1.1[illegible]0	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRF	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

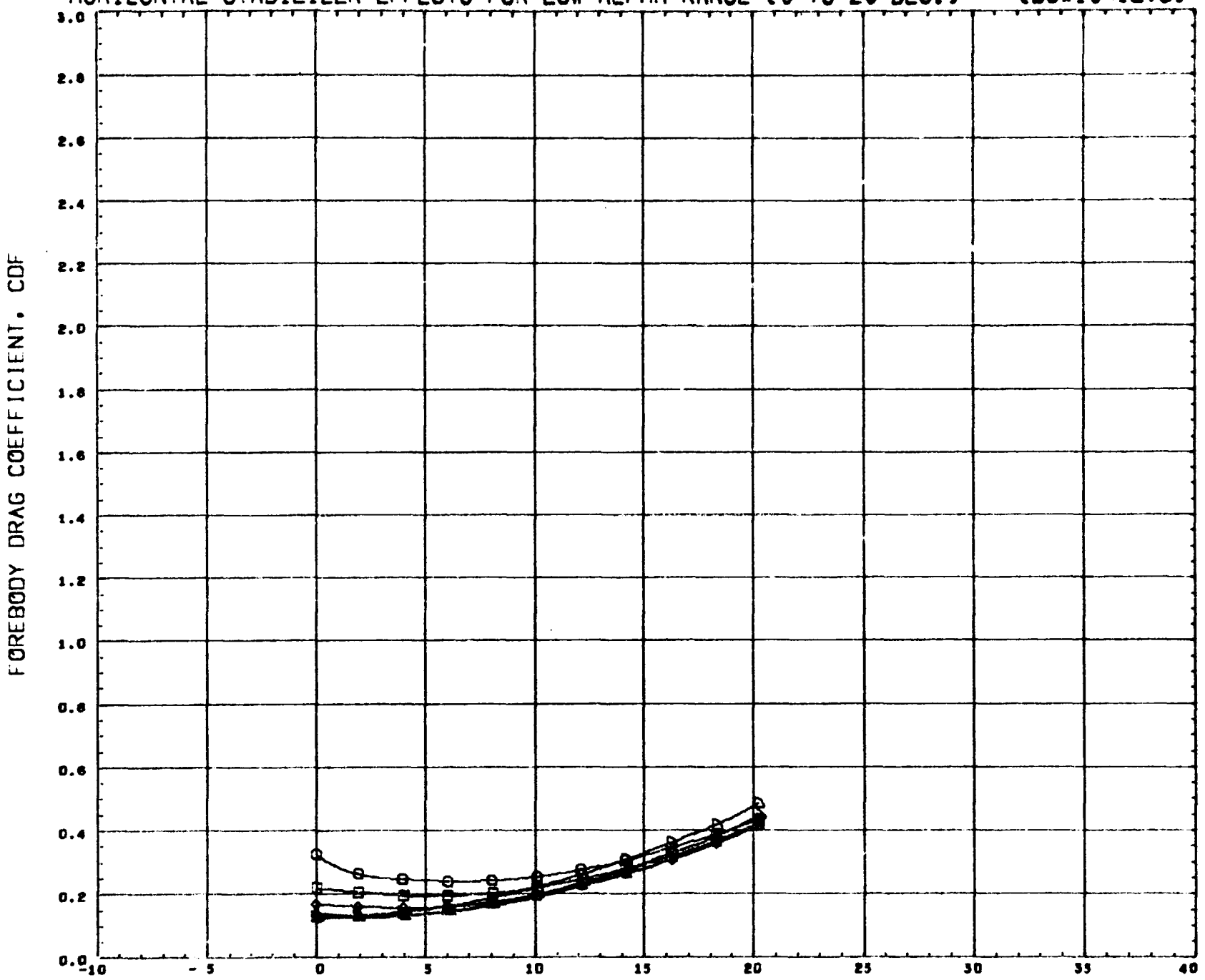
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	MRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	1.958	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▽	0.000				
▷	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

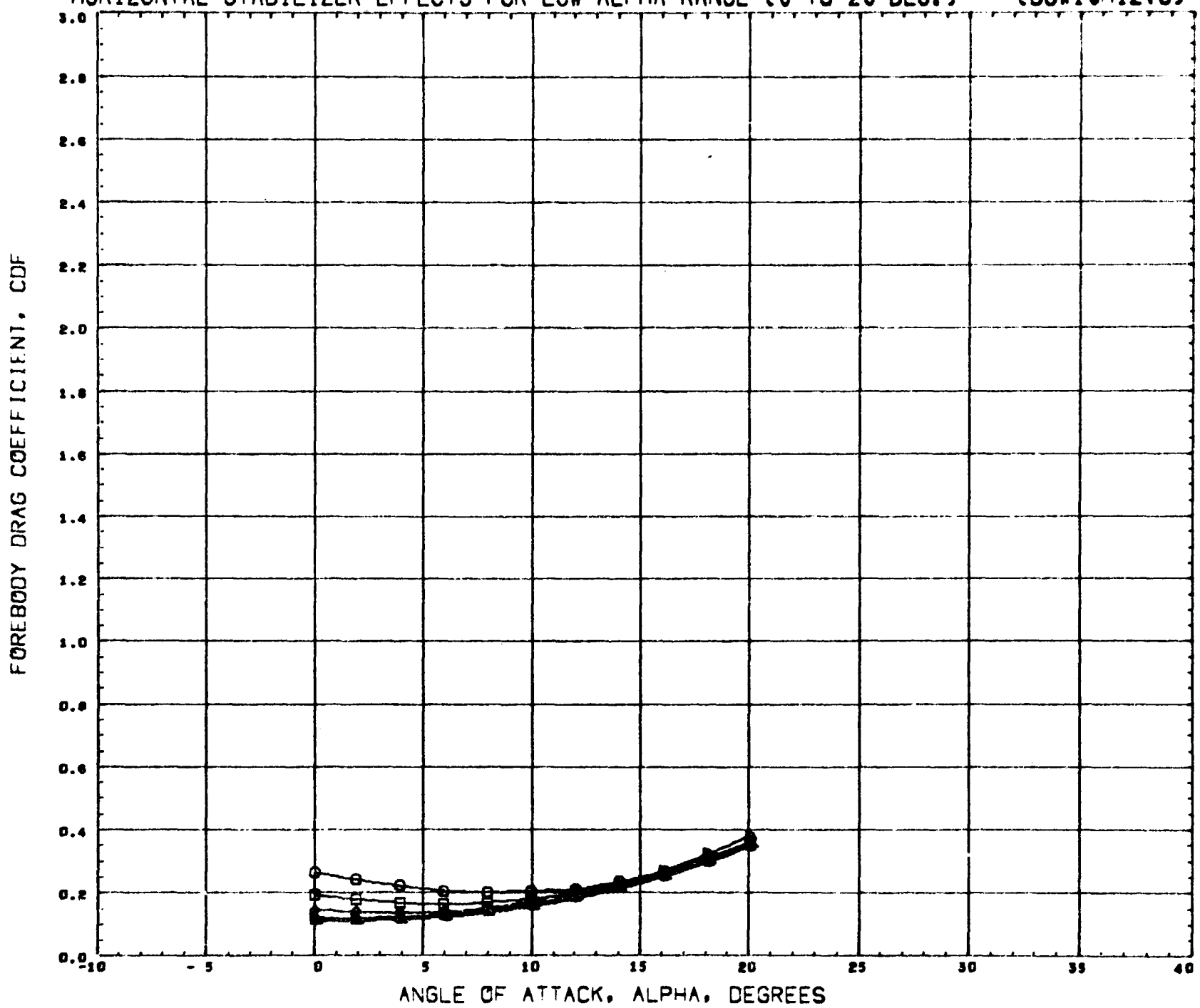
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	2.990	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▷	0.000				
⌓	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCH'S
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

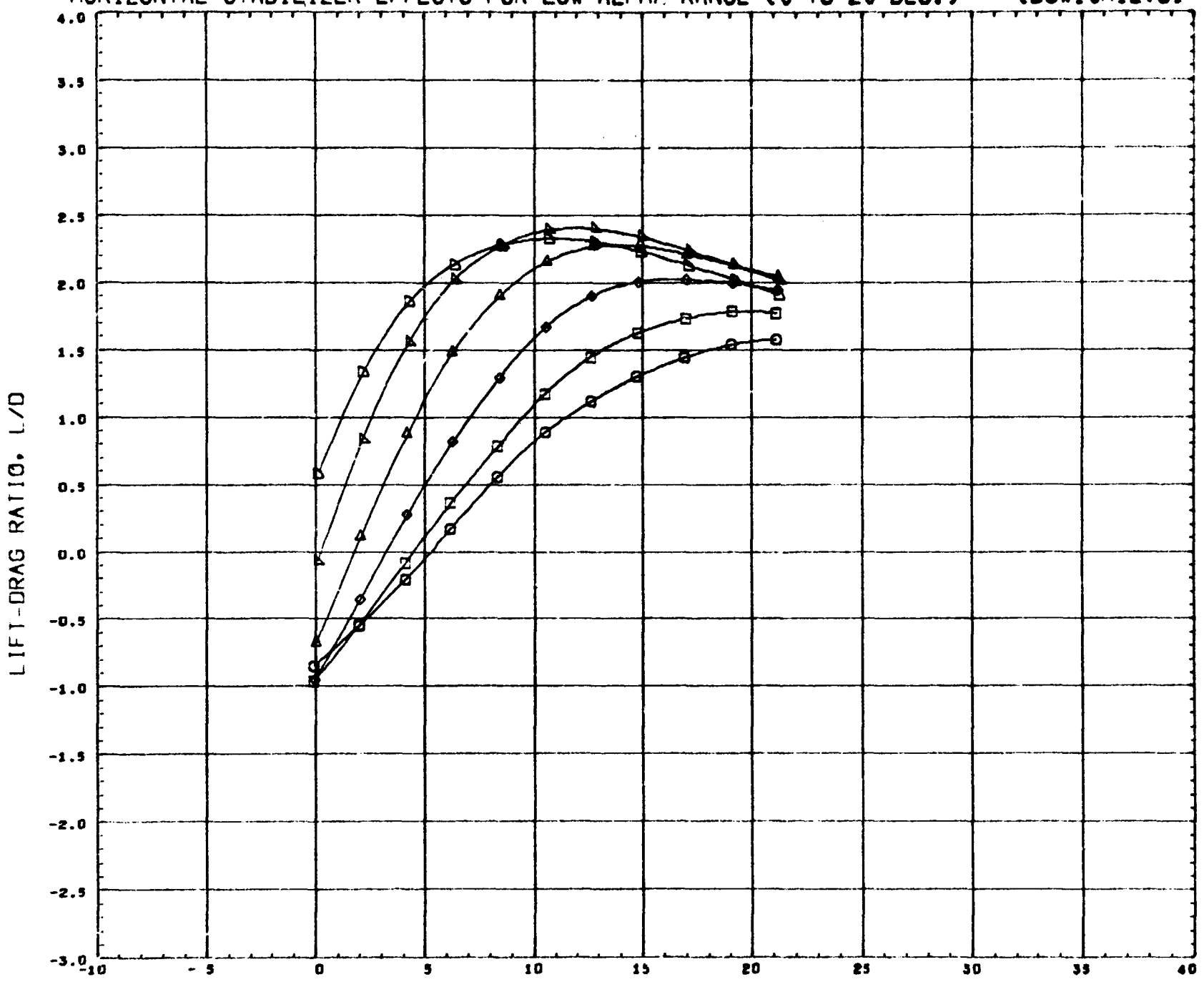
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
O	- 40.000	MACH	4.959	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▽	0.000				
▷	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2100	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

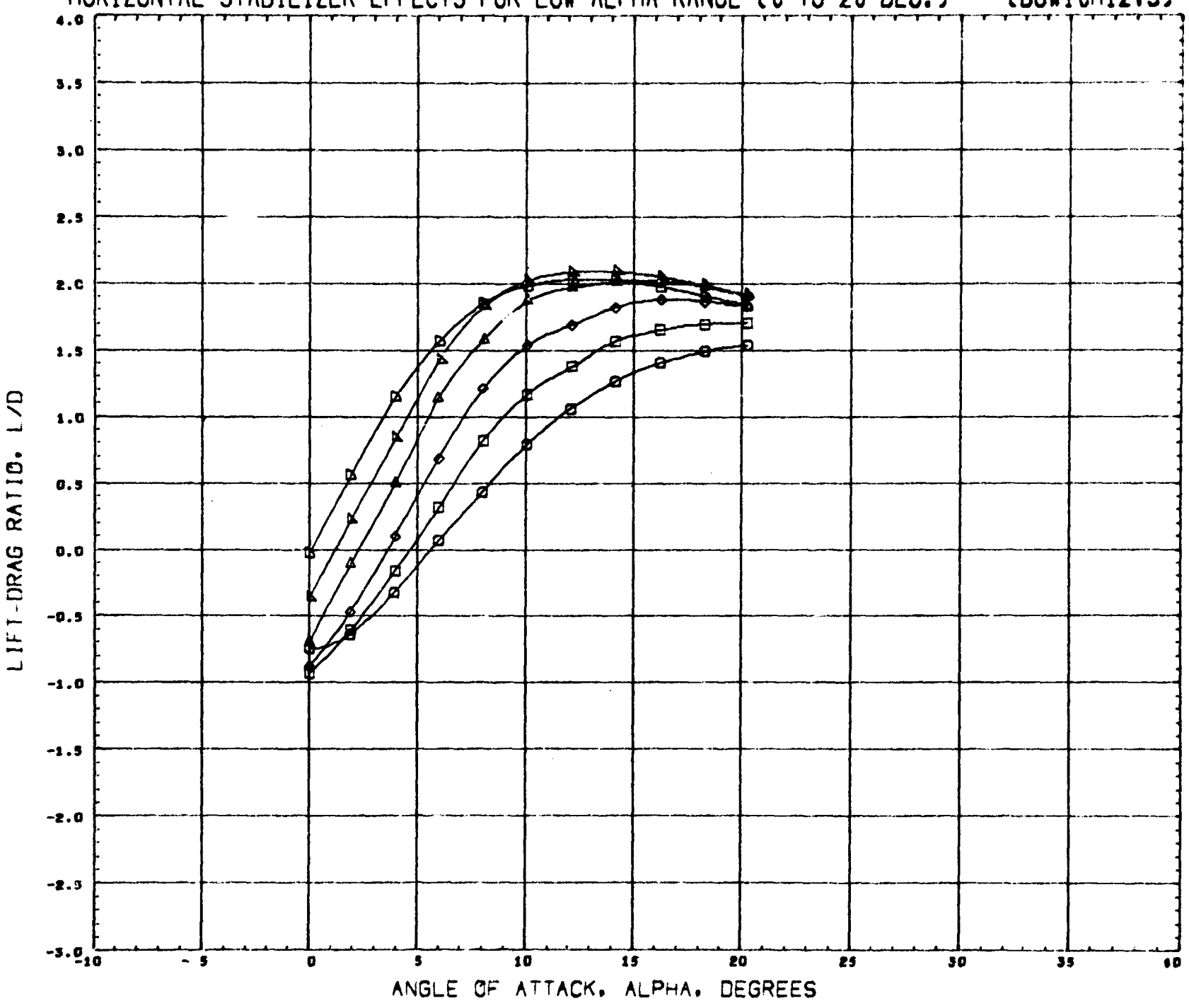
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	1.958	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
◁	0.000				
▷	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)

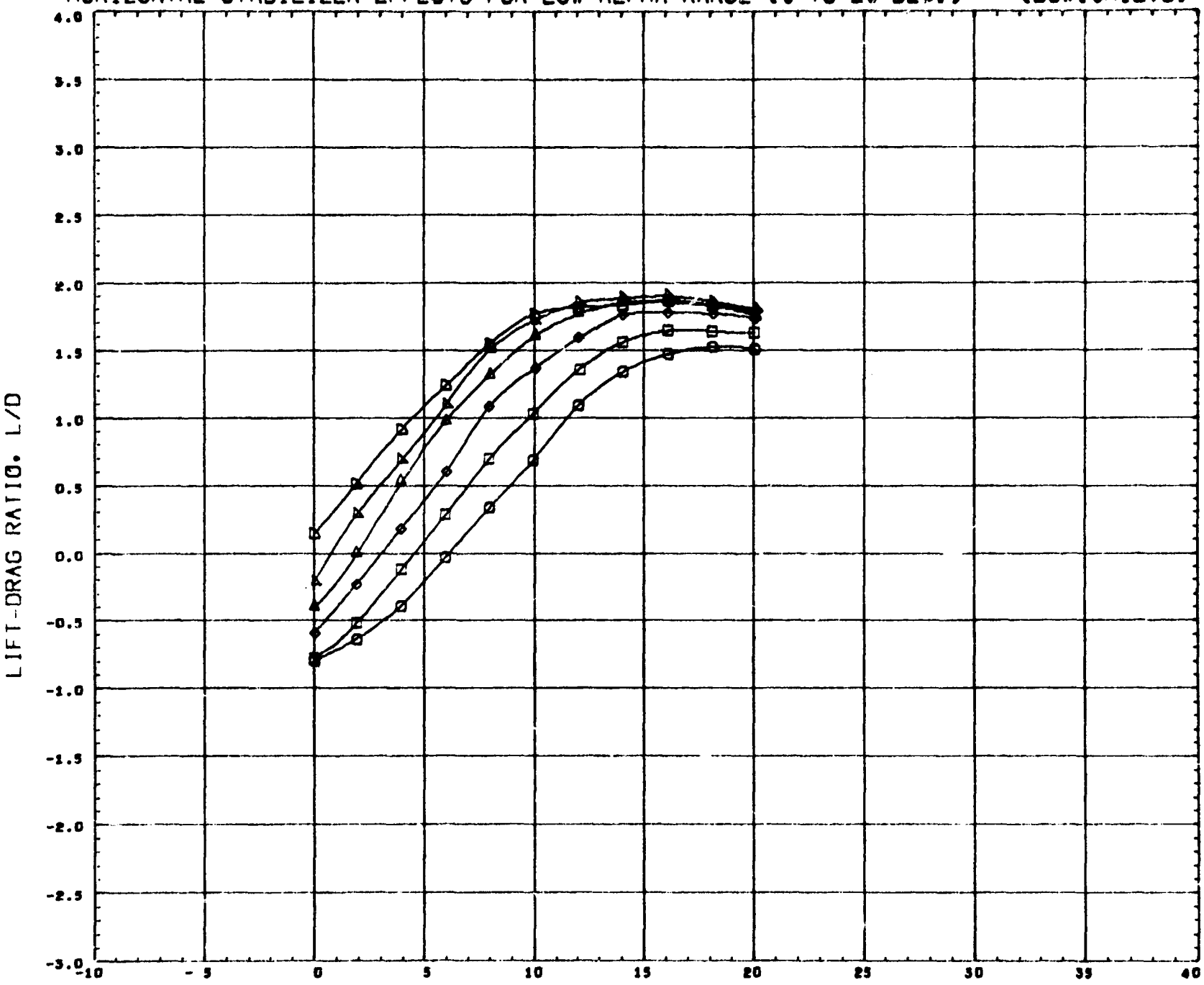


SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	2.990	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▷	.0.000				
▷	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	0.1780	INCHES
SCALE	0.0035	SCALE

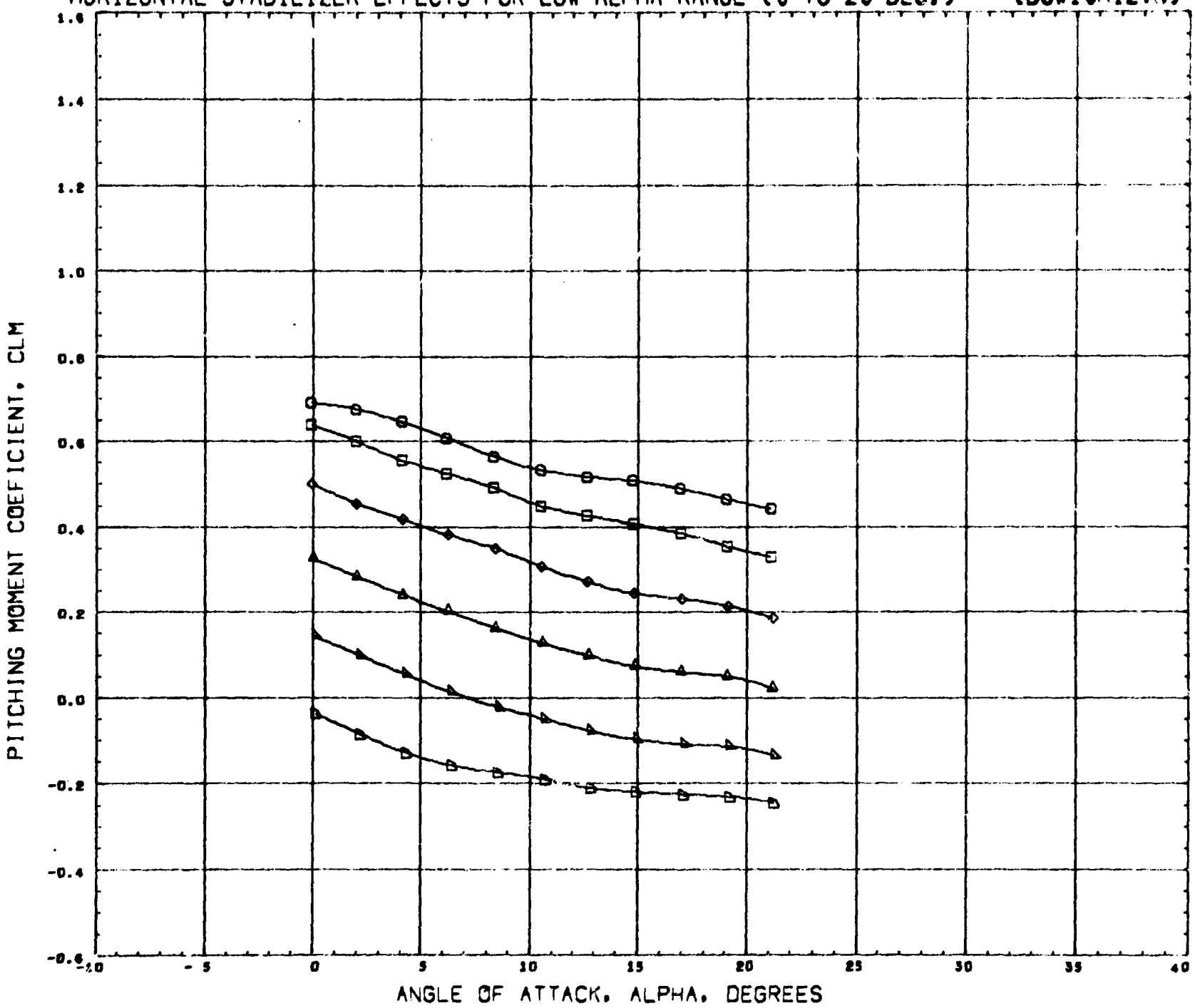
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	4.959	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▲	0.000				
▷	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

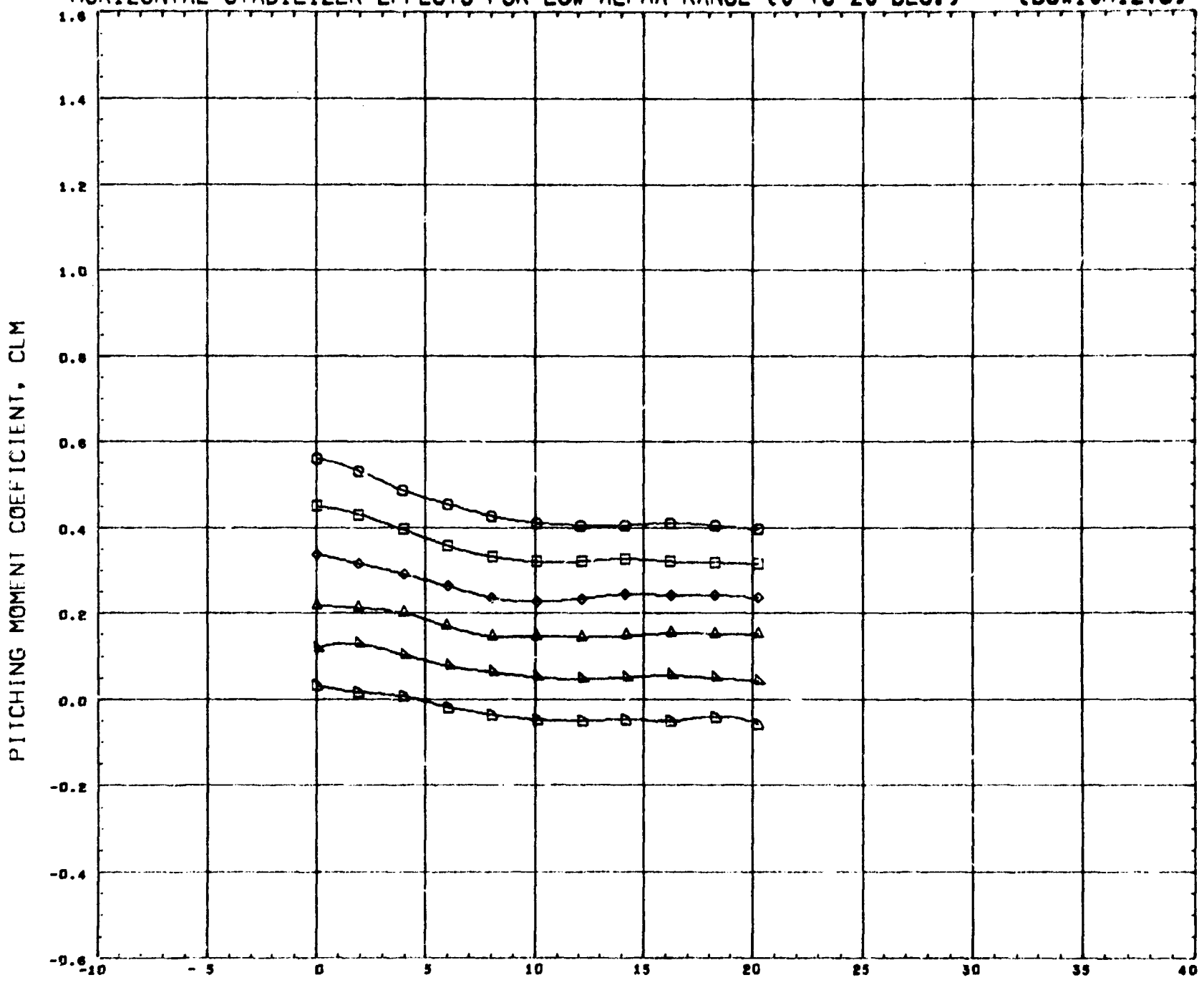
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	1.958	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▷	0.000				
▽	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

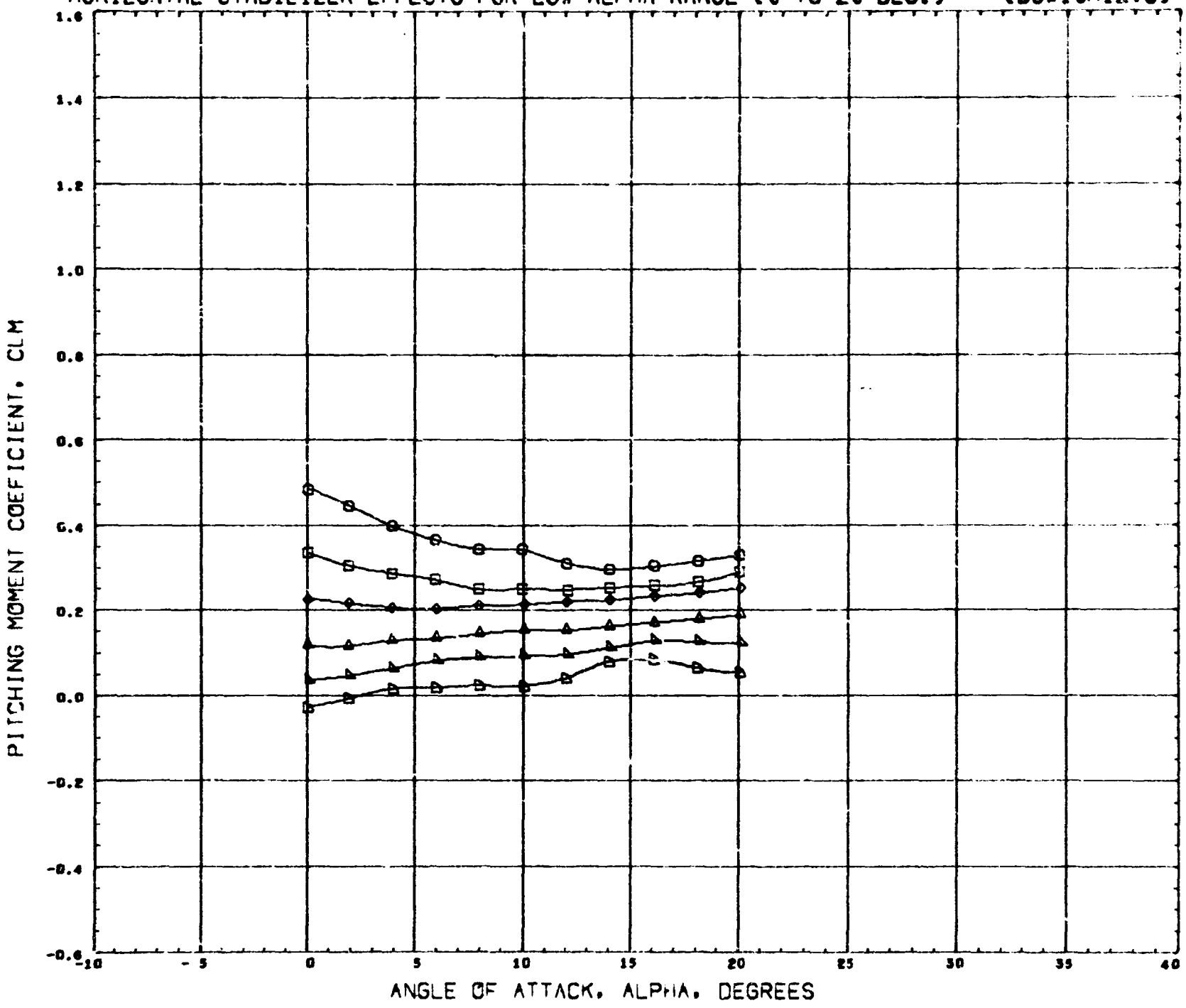
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	2.990	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▽	0.000				
⊃	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1740	INCHES
SCALE	0.0035	SCALE

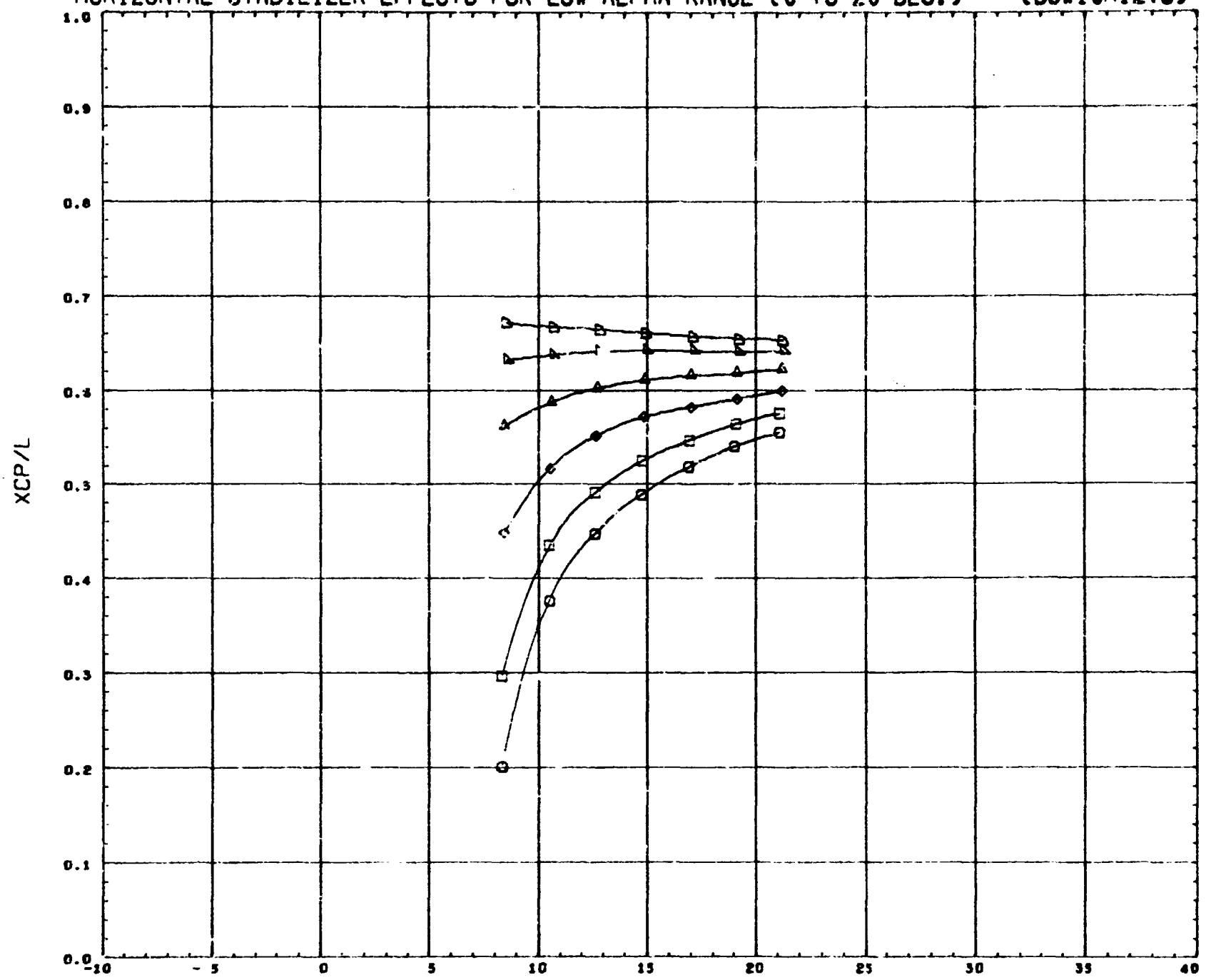
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	4.959	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▷	0.000				
▽	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	3.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

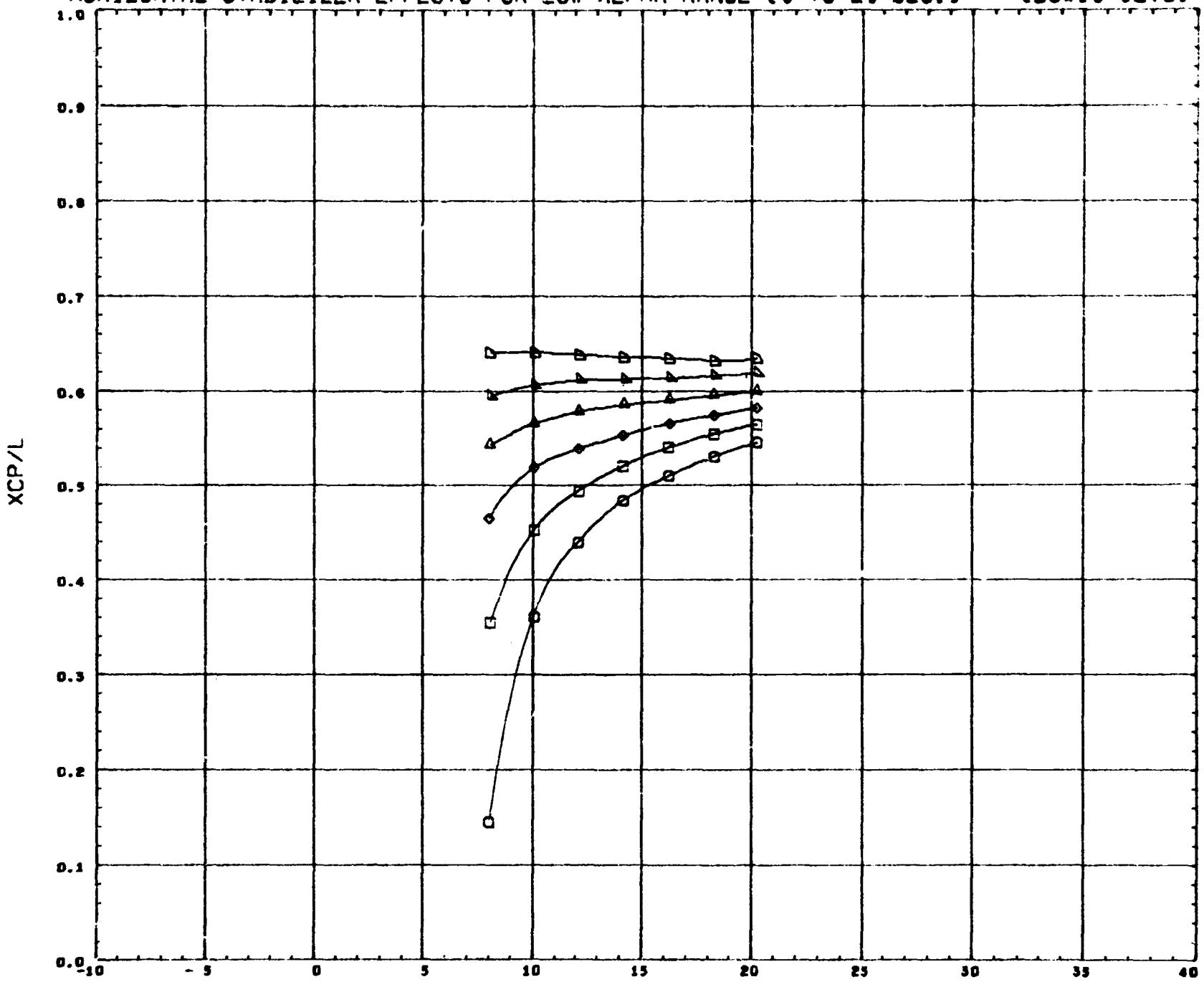
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	1.958	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
◺	0.000				
◺	10.000	DATA HIST. CODE	#6		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

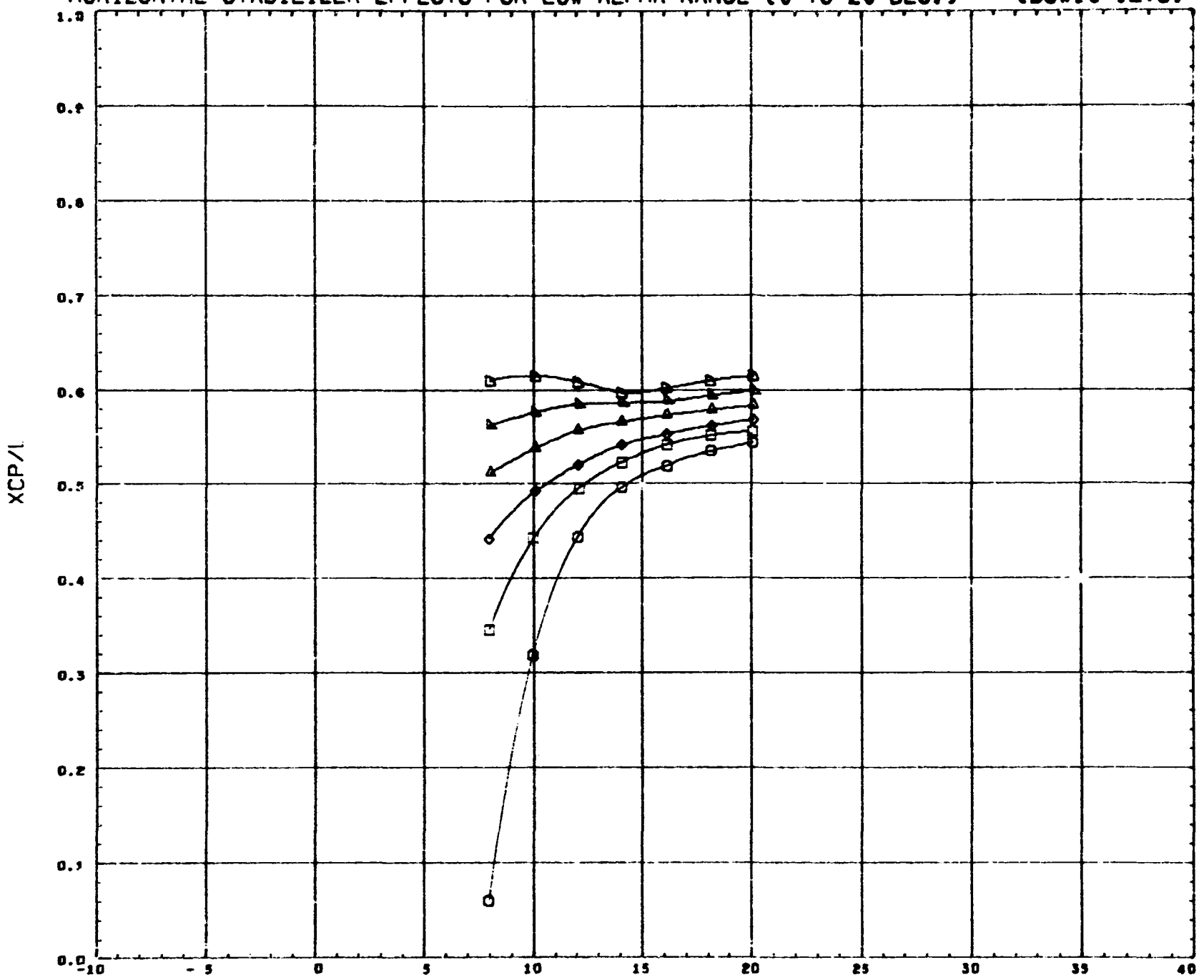
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	MRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	2.990	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▲	0.000				
▷	10.000	DATA HIST. CODE	#6		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

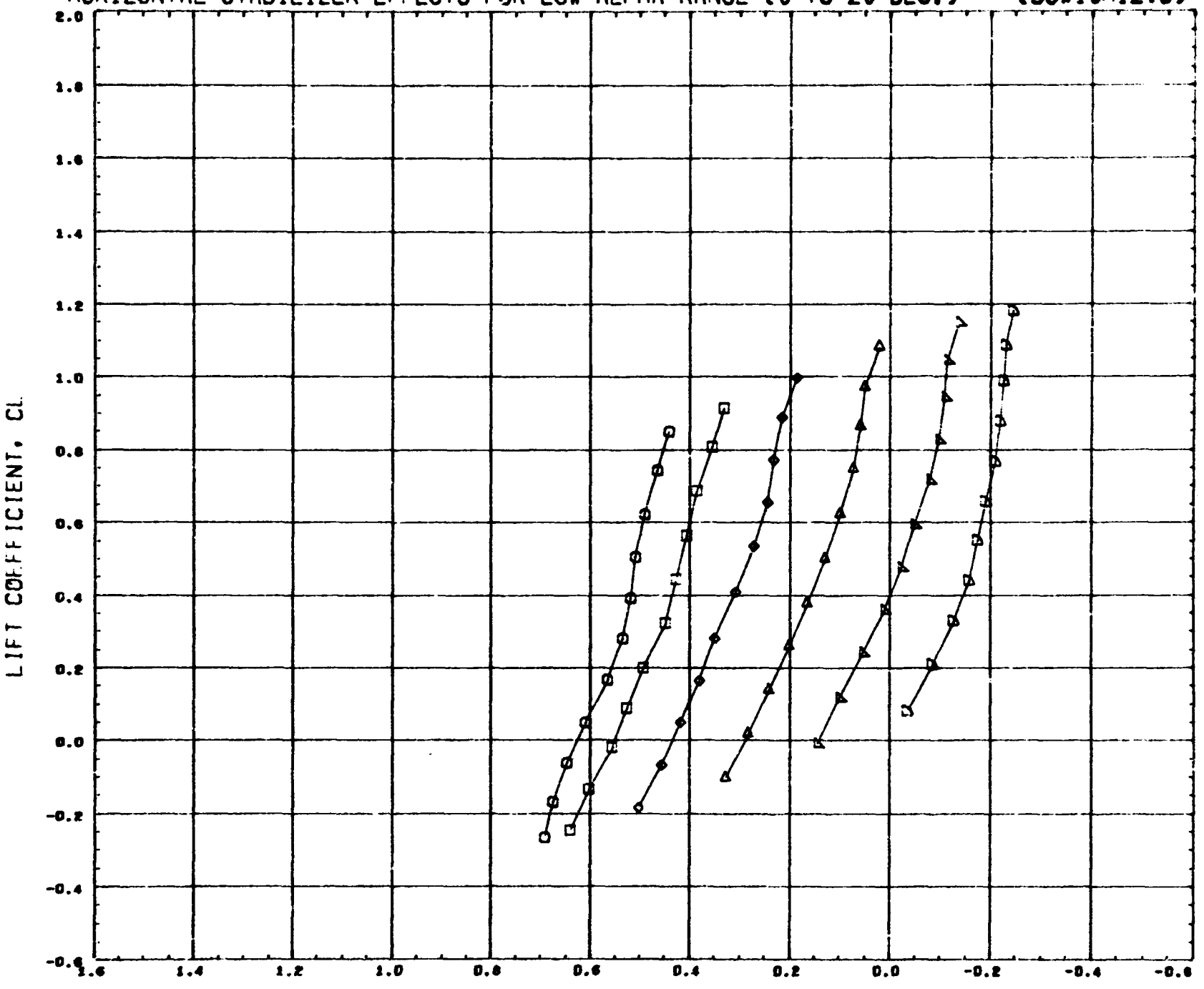
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W1OH12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
O	- 40.000	MACH	4.959	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▷	0.000				
▷	10.000	DATA HIST. CODE	*G		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

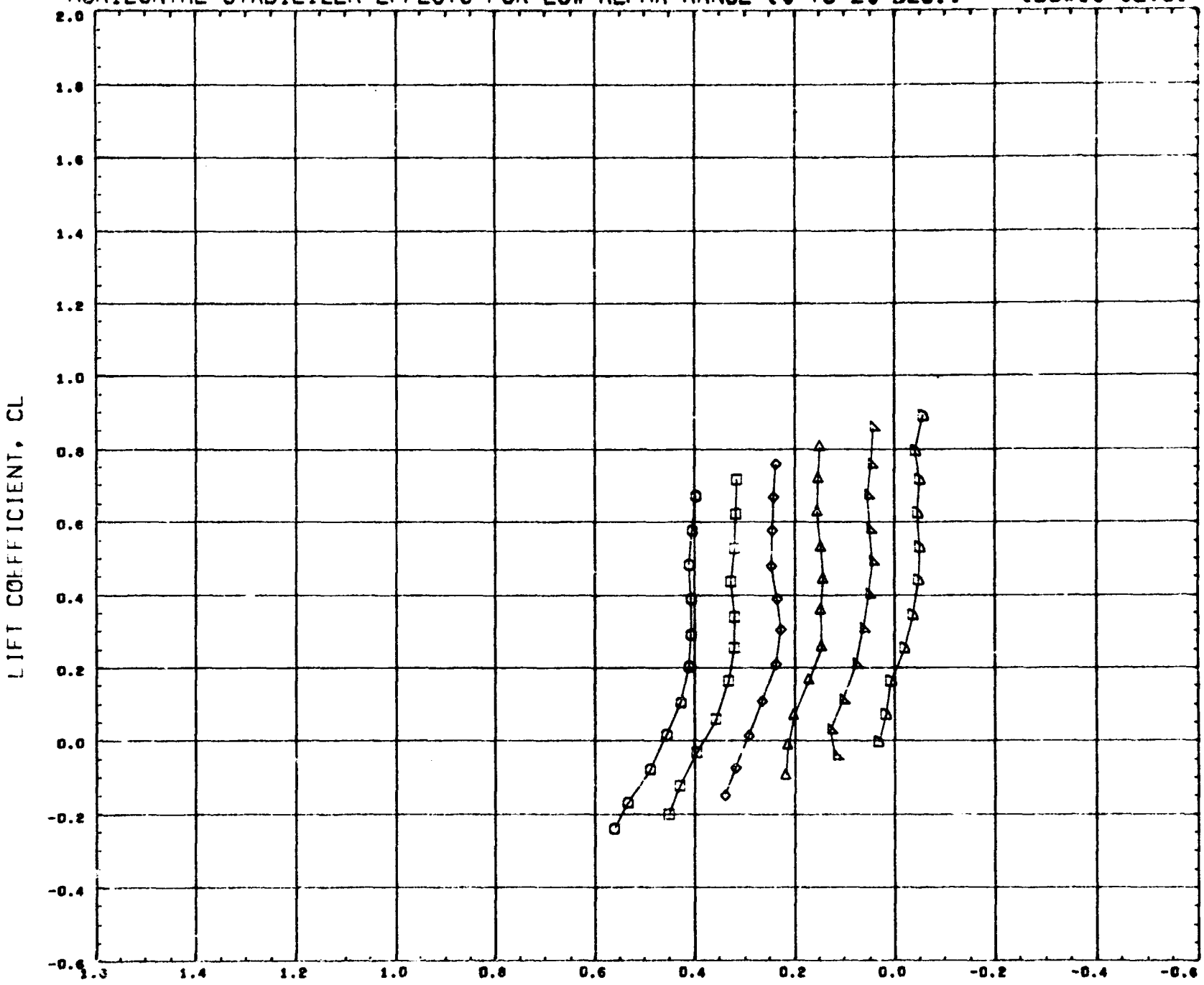
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	1.958	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▷	0.000				
▽	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

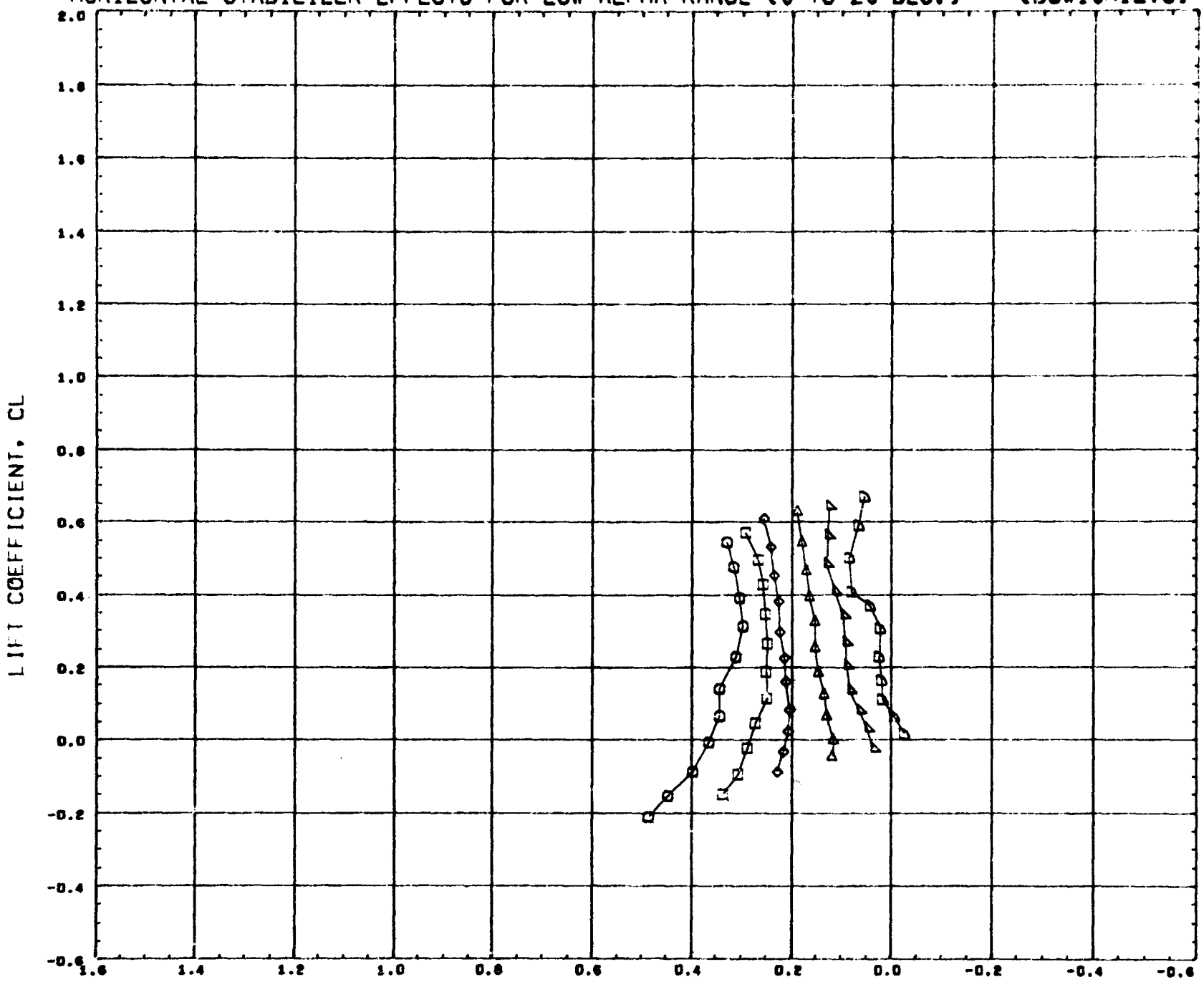
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
O	- 40.000	MACH	2.990	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
⊿	0.000				
▱	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)

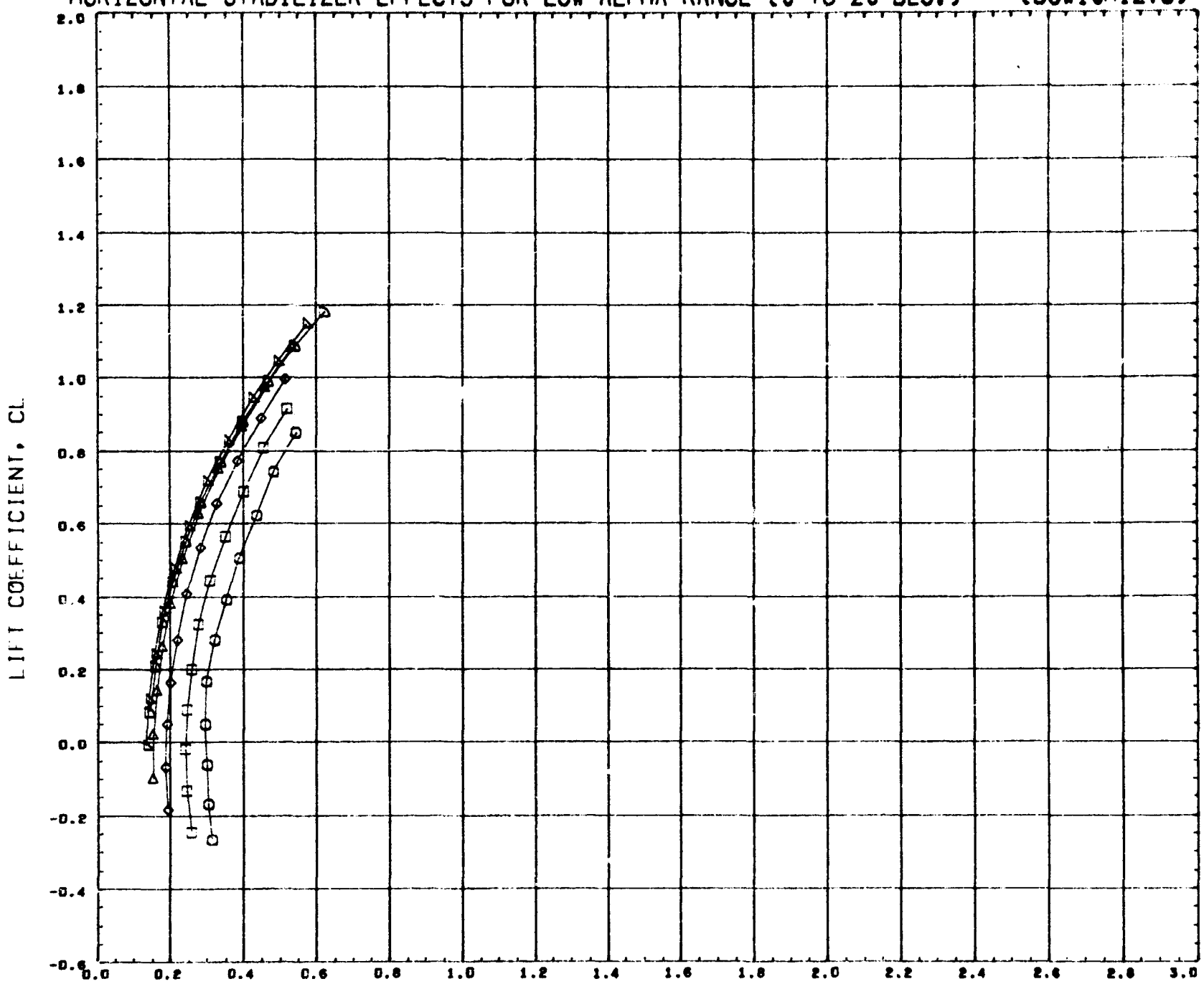


SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	4.959	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▽	0.000				
▷	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

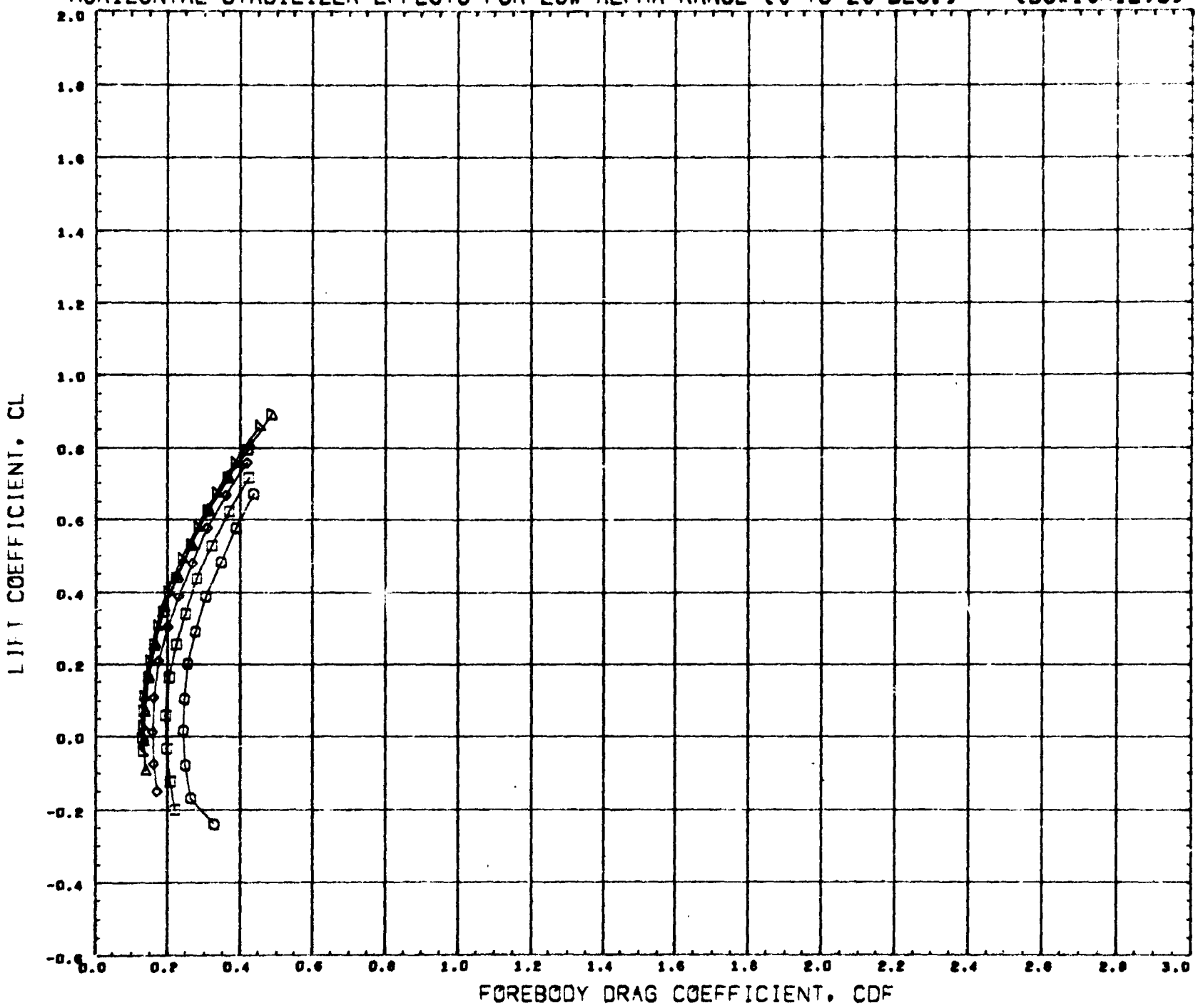
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	1.958	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
◁	0.000				
▷	10.000	REFERENCE FILE		NA 70 446	

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

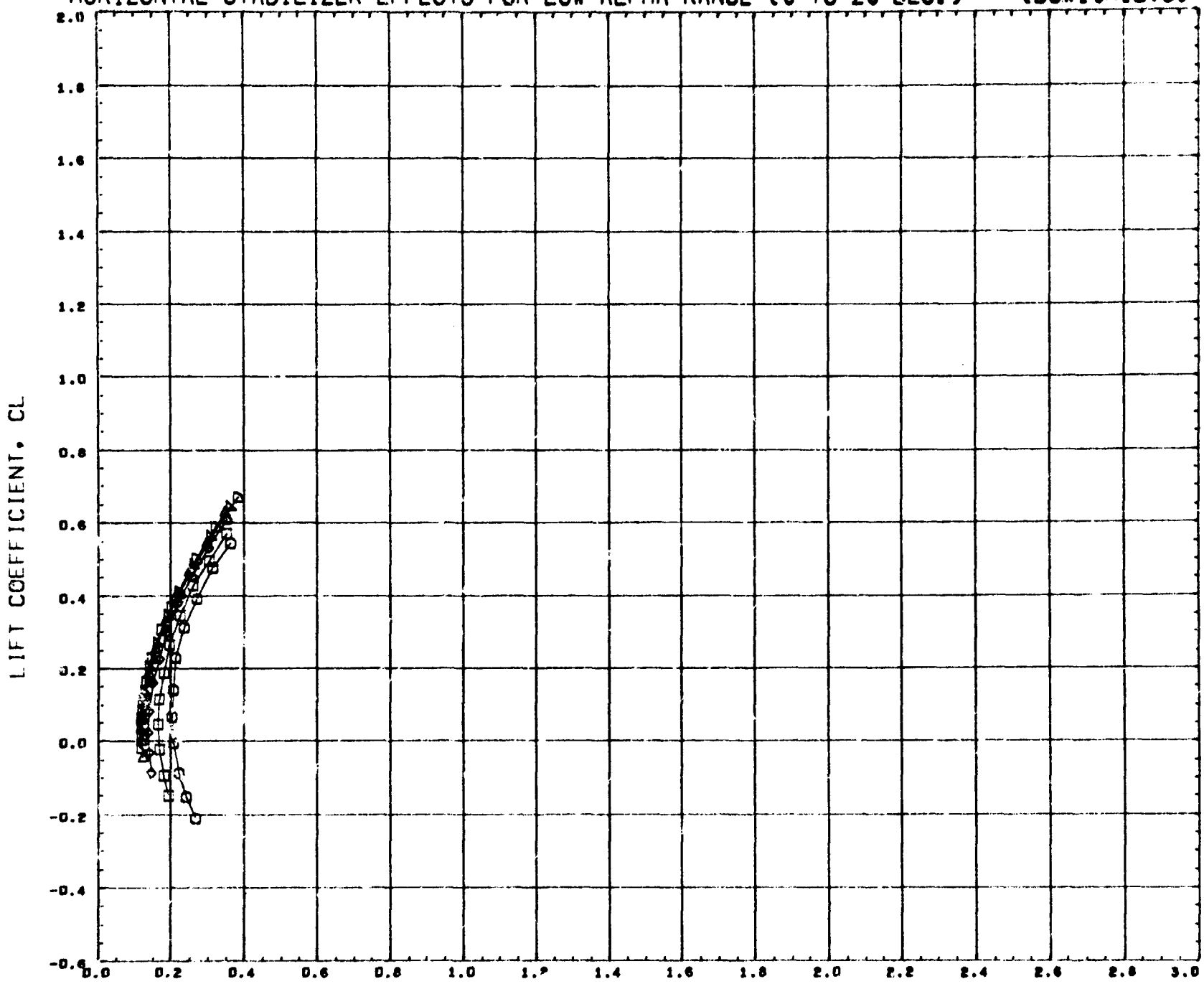
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	2.990	BETA	0.000
□	- 30.000				
◇	- 20.000				
△	- 10.000				
▽	0.000				
▷	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

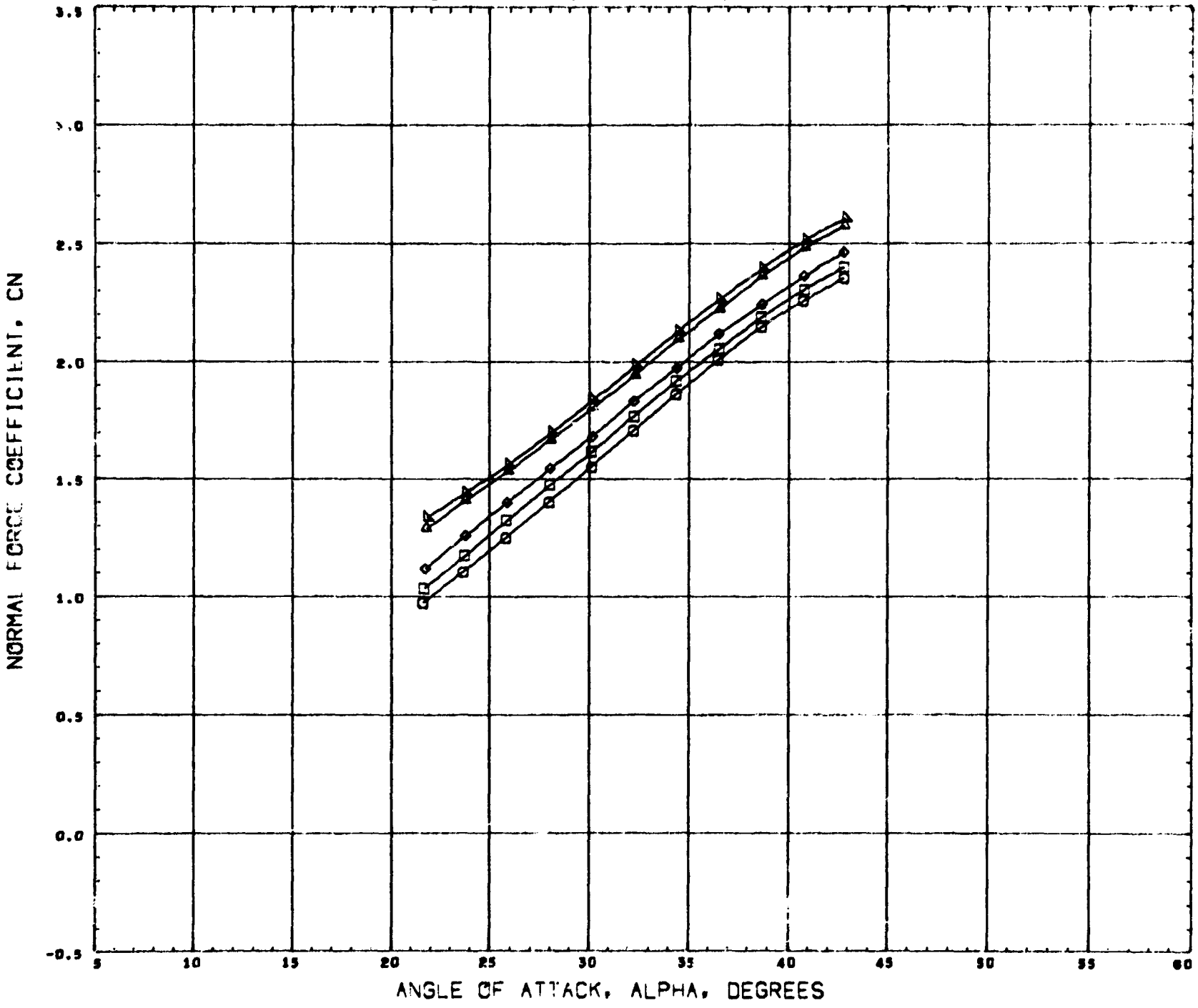
HORIZONTAL STABILIZER EFFECTS FOR LOW ALPHA RANGE (0 TO 20 DEG.) (B6W10H12V5)



SYMBOL	HRZN.TL	PARAMETRIC VALUES			
O	40.000	MACH	4.939	BETA	0.000
□	30.000				
◇	20.000				
△	10.000				
⊿	0.000				
D	10.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	-0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)

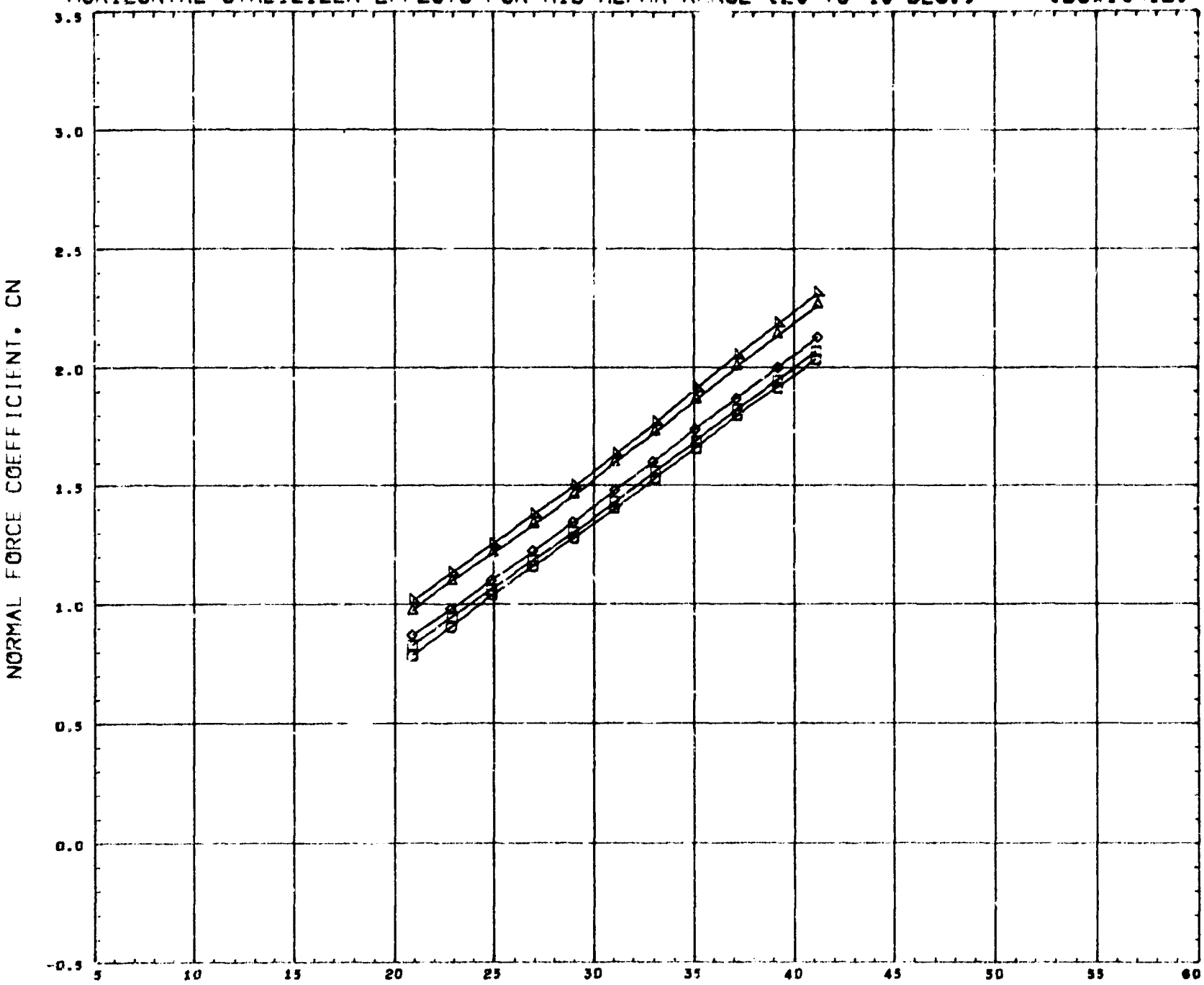


SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	1.958	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▽	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)

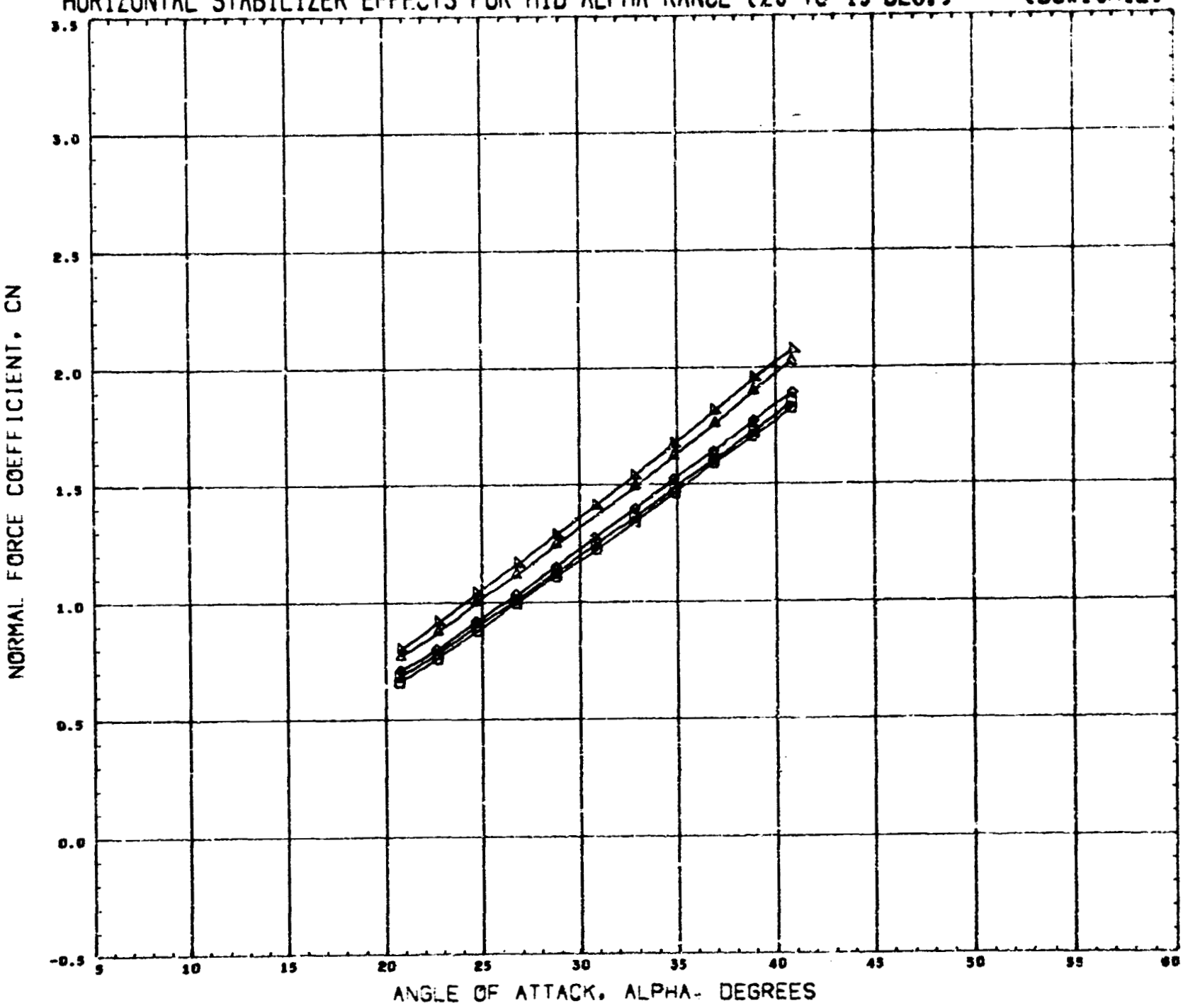


SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	2.990	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▽	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1760	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W1OH12)

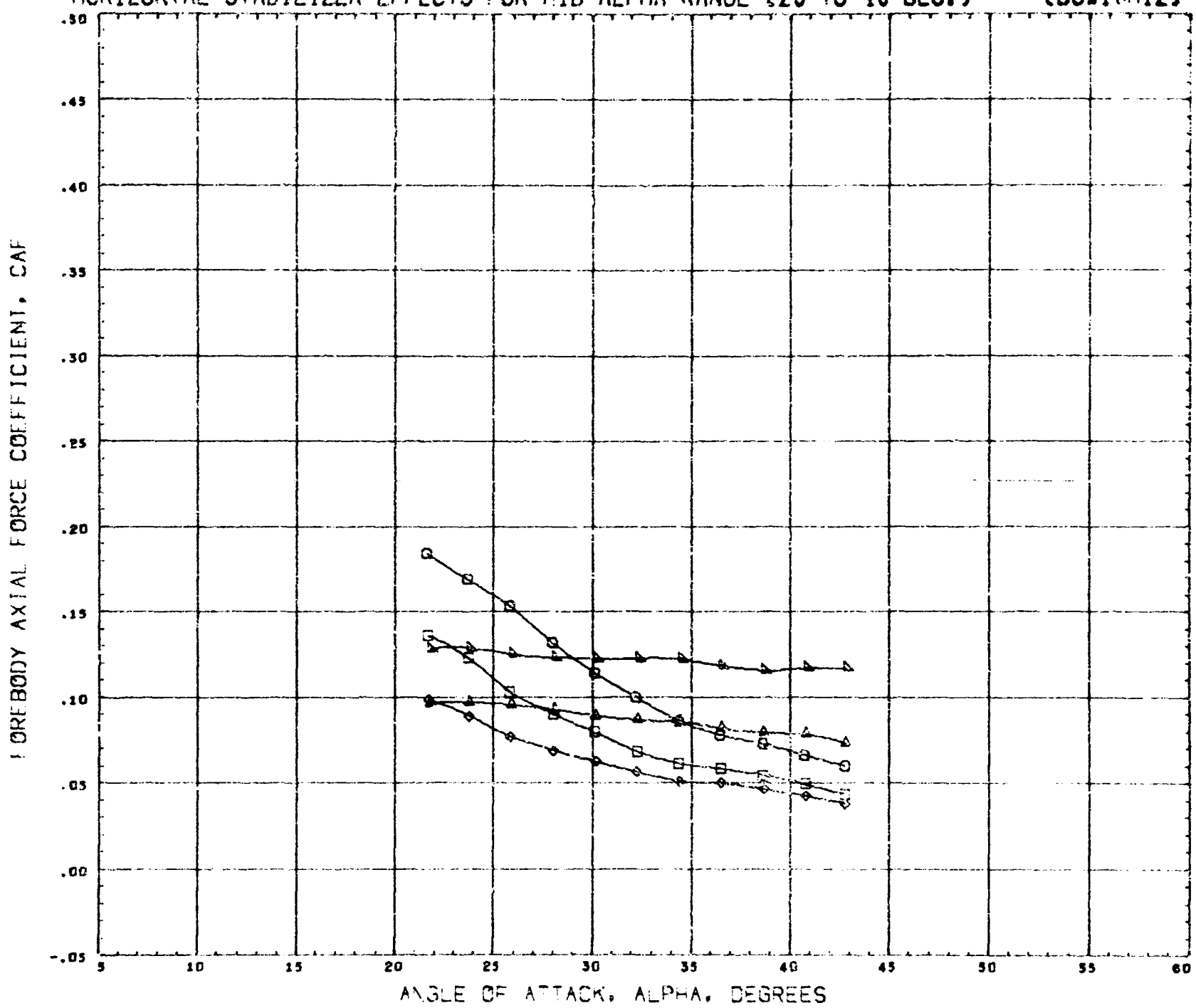


SYMBOL	HRZNTL		PARAMETRIC VALUES		
O	- 40.000	MACH	4.959	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▷	10.000				

REFERENCE FILE NA 70 448

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1760	INCHES
SCALE	0.0035	SCALE



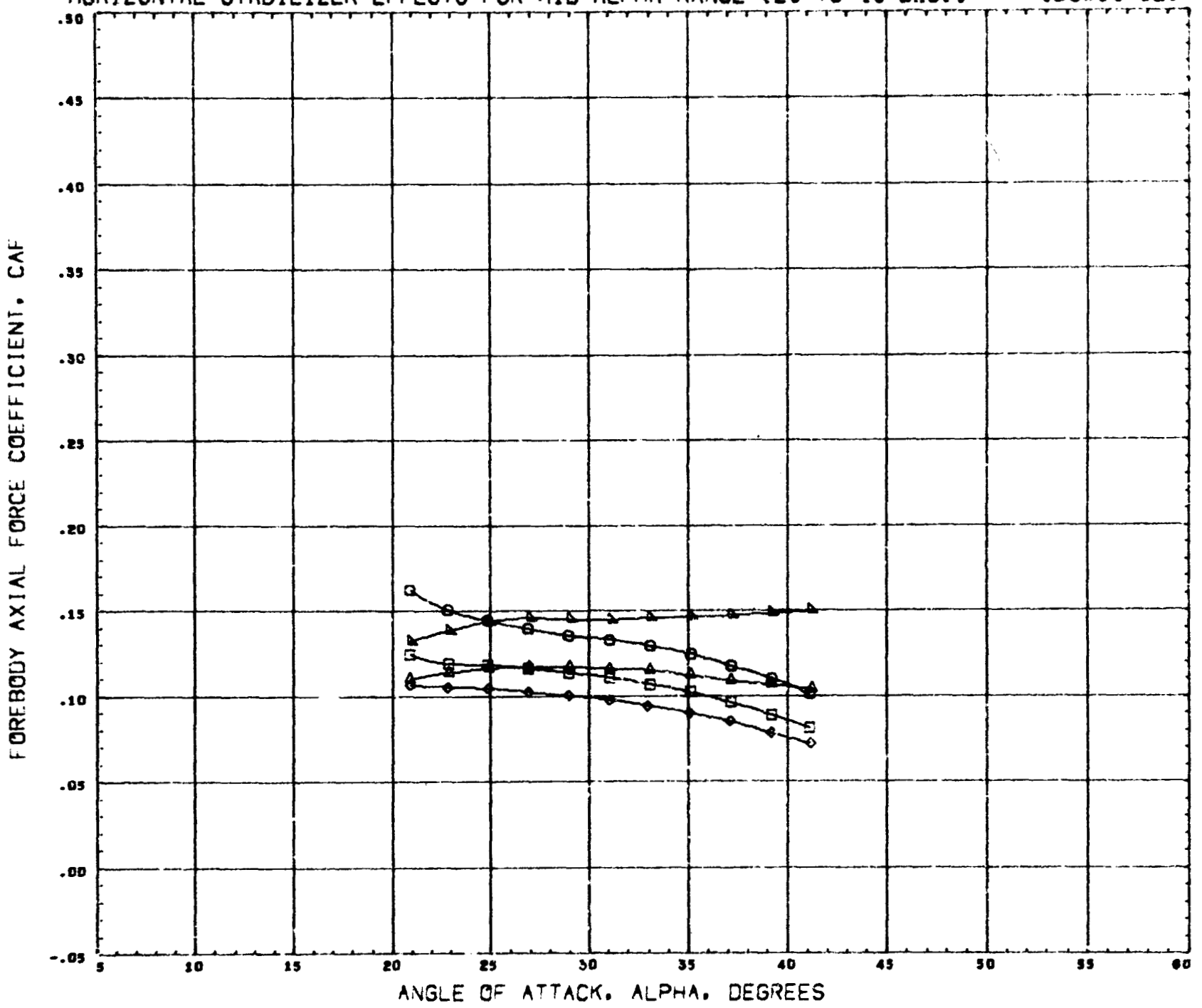
SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	1.958	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▽	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)

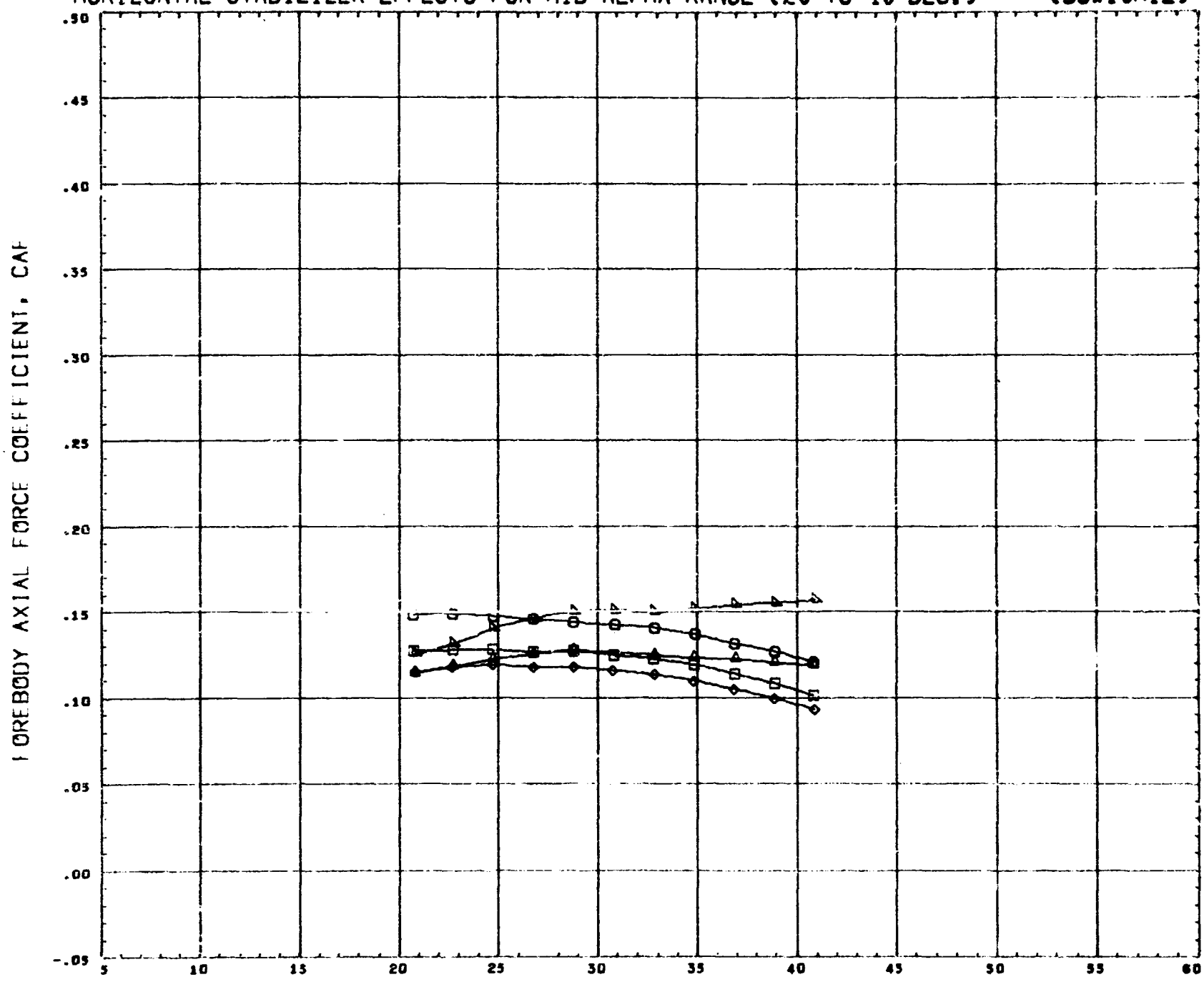


SYMBOL	NRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	2.990	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▽	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5267	INCHES
YMRP	0.000_	[illegible]HES
ZMRP -	0.1780	[illegible]CHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)

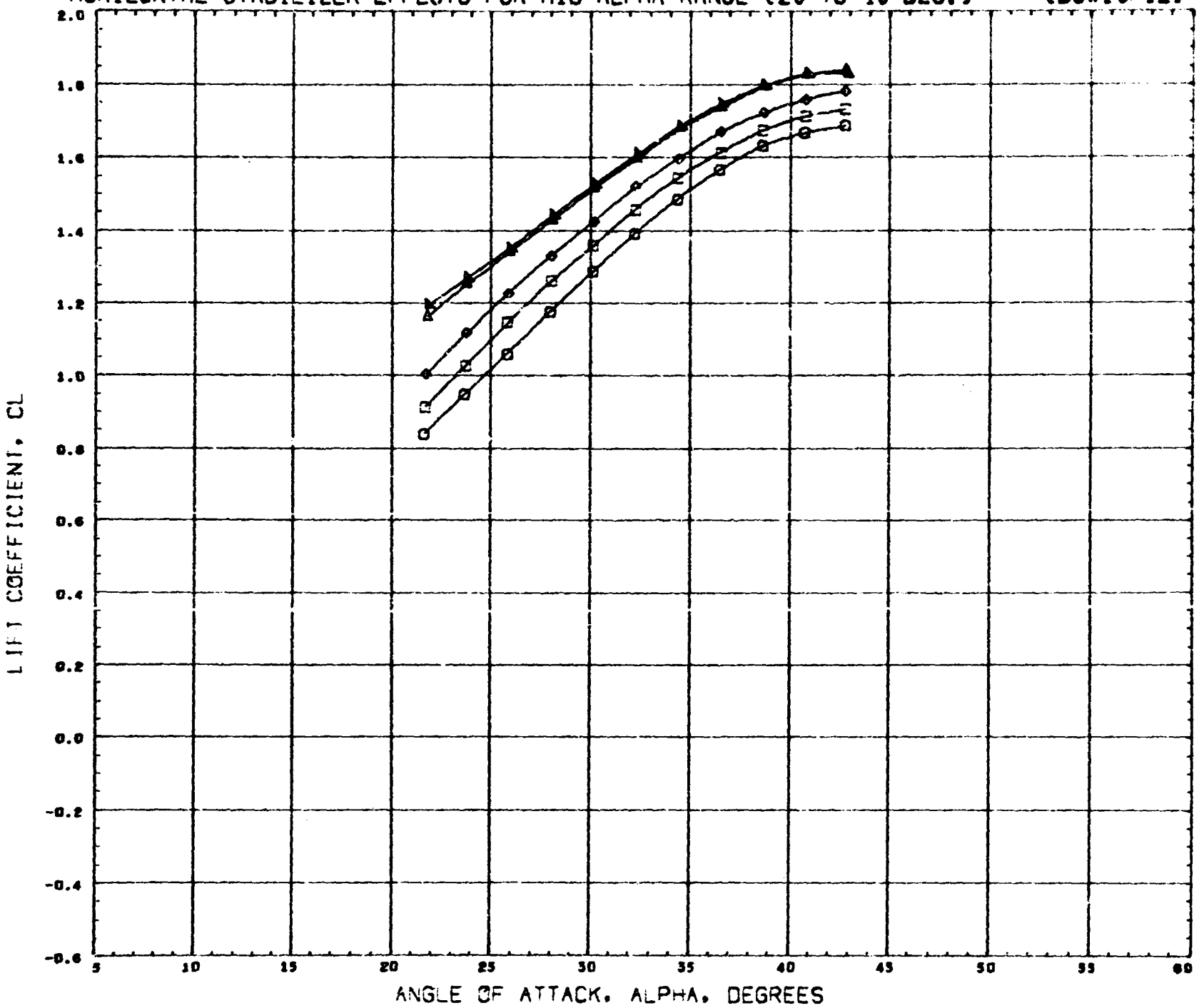


SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	4.959	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▽	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)

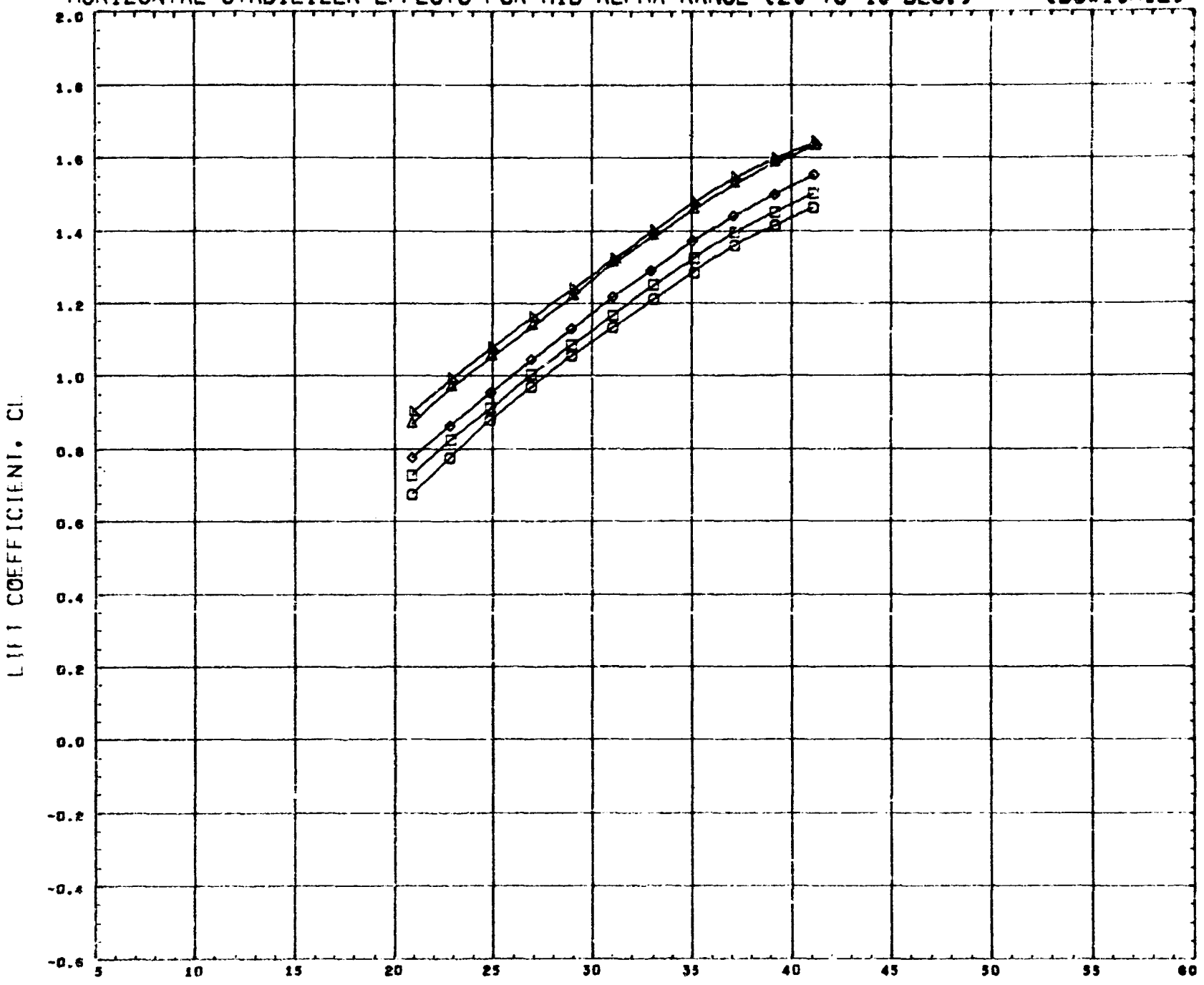


SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	1.958	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▽	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)



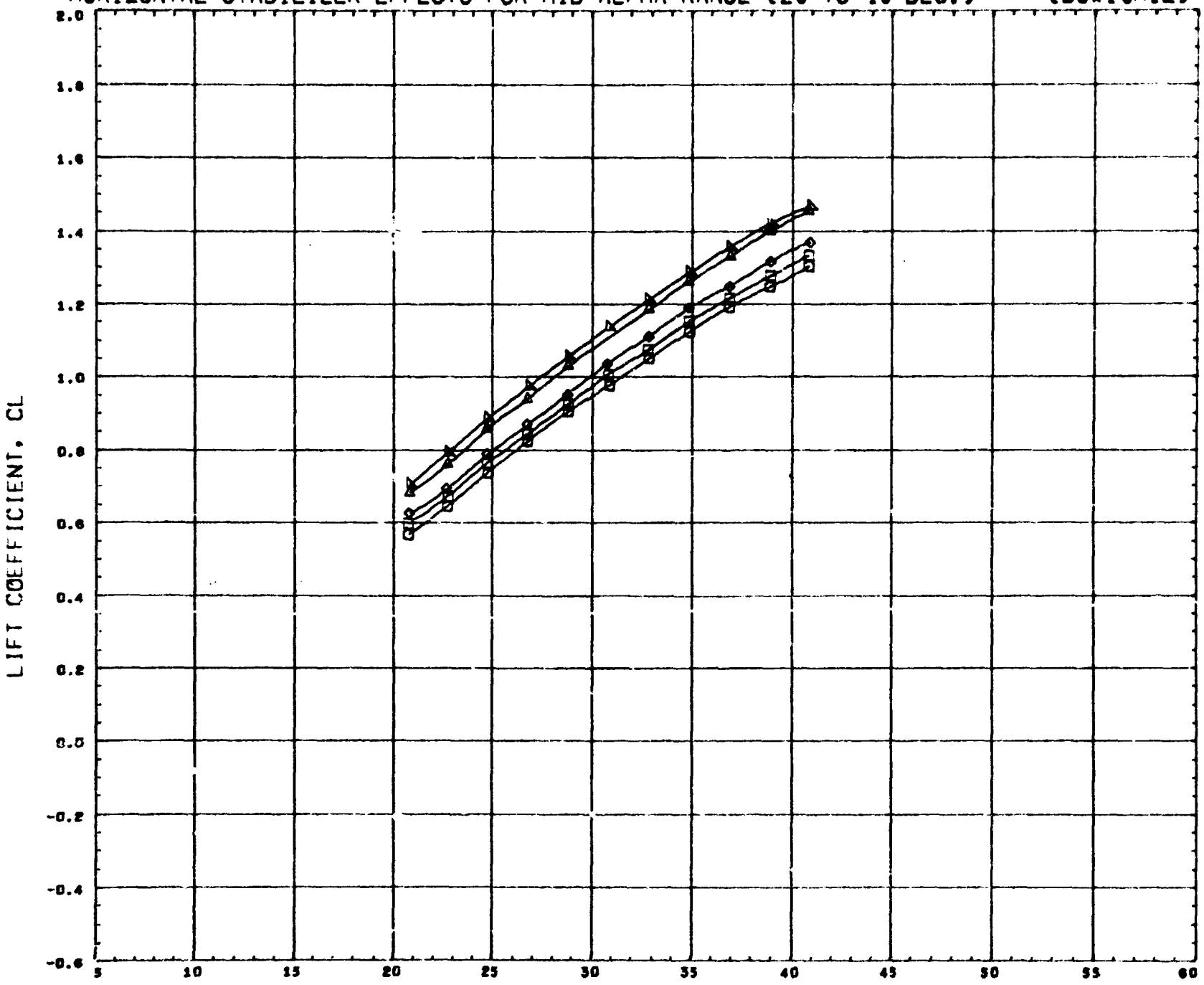
SYMBOL	HRZNTL	PARAMETRIC VALUES			
O	- 40.000	MACH	2.990	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▷	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

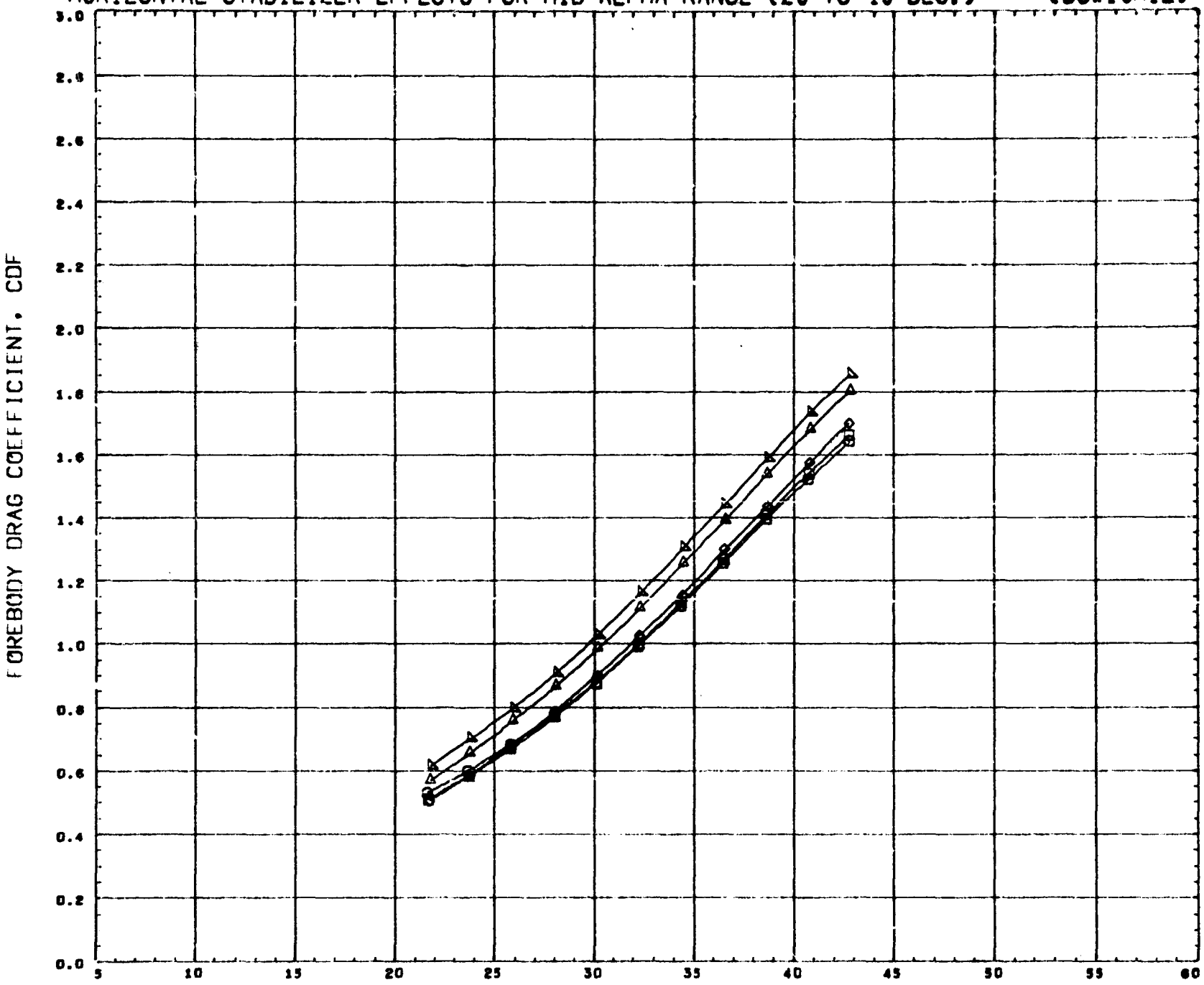
HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)



SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	4.959	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▷	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

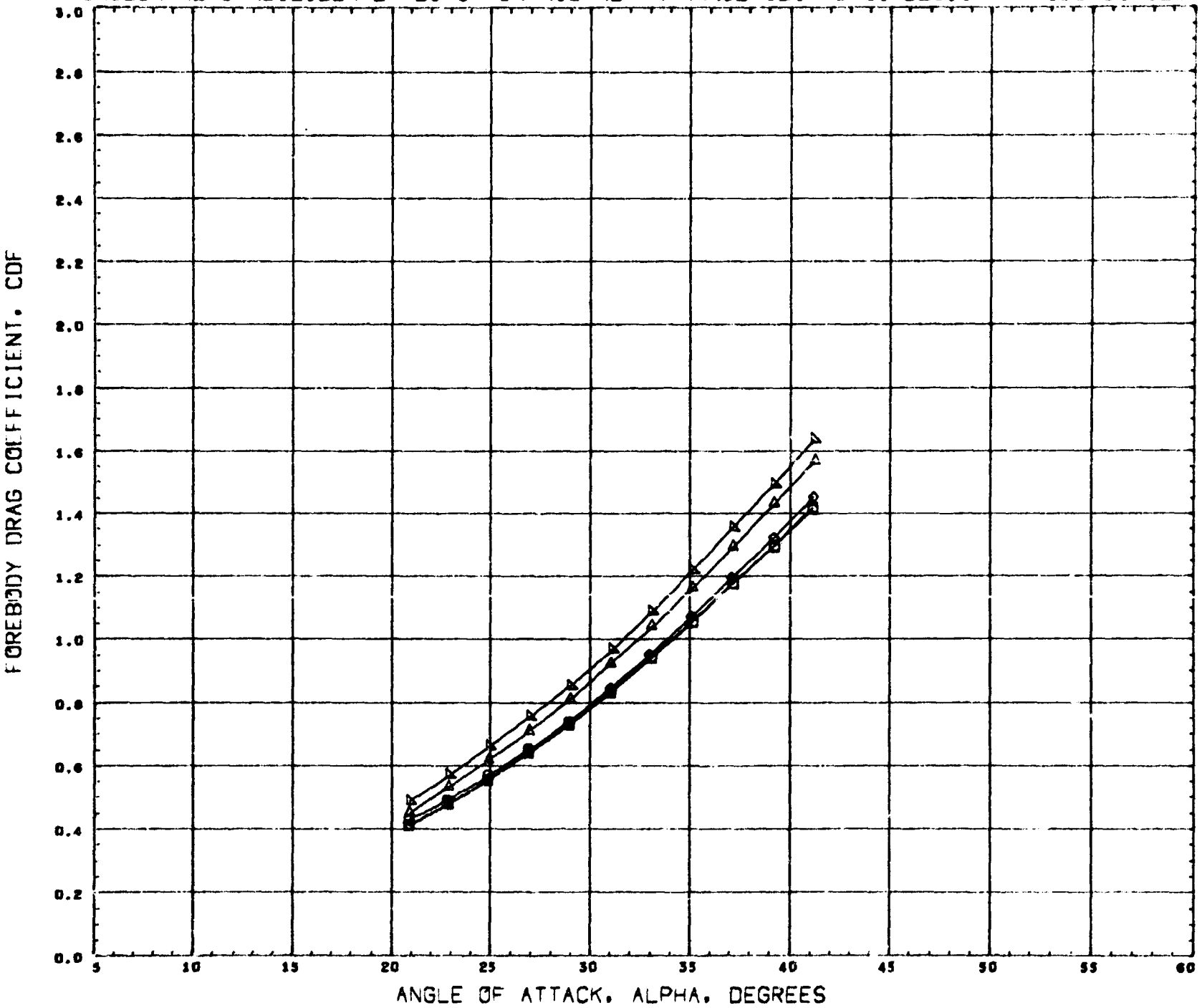


SYMBOL	HRZNTL	PARAMETRIC VALUES			
□	- 40.000	MACH	1.958	BETA	0.010
◇	- 30.000				
△	- 20.000				
▷	0.000				
	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

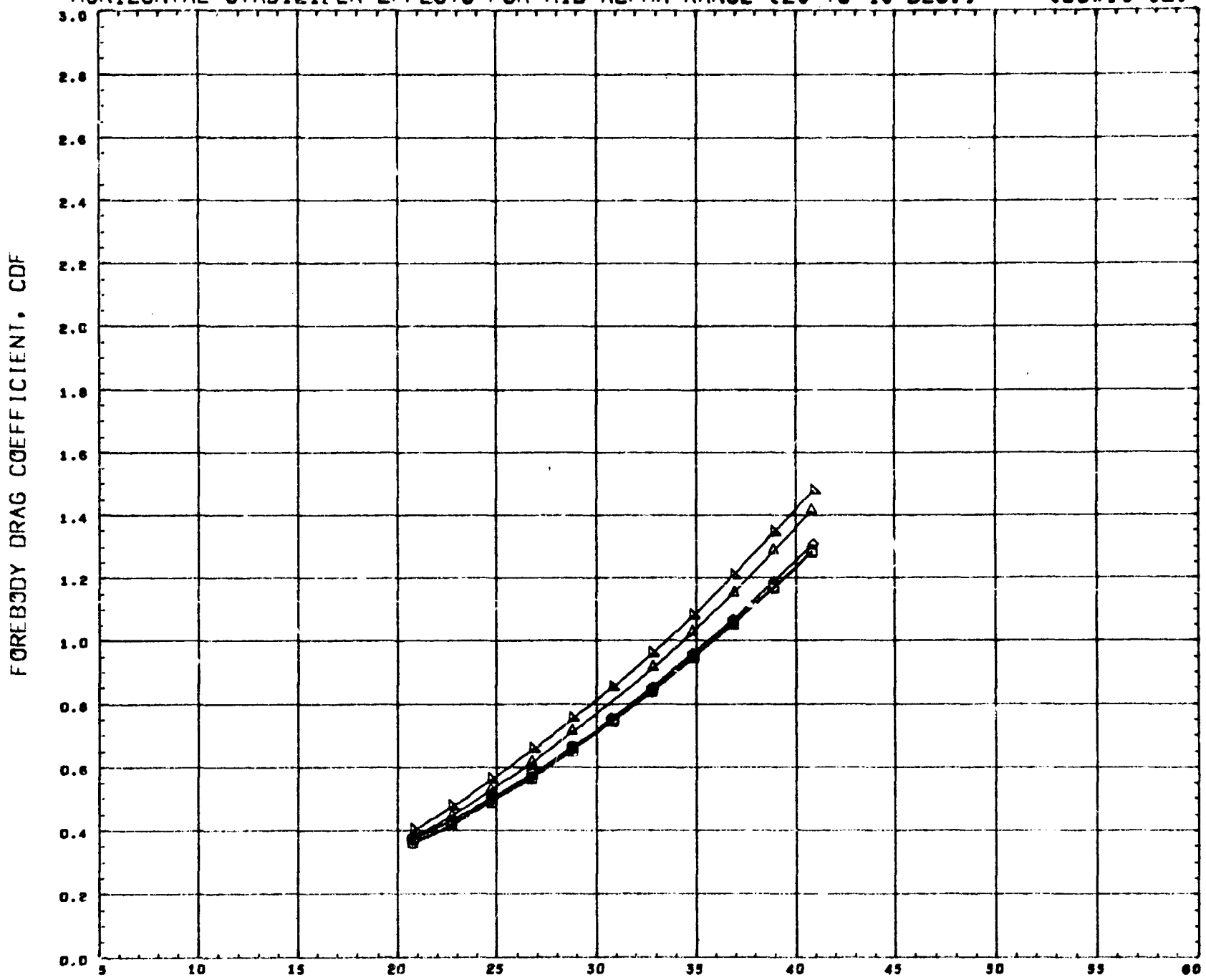
HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)



SYMBOL	HRZNTL	PARAMETRIC VALUES				REFERENCE INFORMATION		
○	- 40.000	MACH	2.990	BETA	0.010	REFS	5.4400	SQINCH
□	- 30.000					REFL	1.1300	INCHES
◇	- 20.000					REFB	5.2150	INCHES
△	0.000					XMRP	4.5260	INCHES
▷	10.000					YMRP	0.0000	INCHES
						ZMRP -	0.1780	INCHES
						SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)

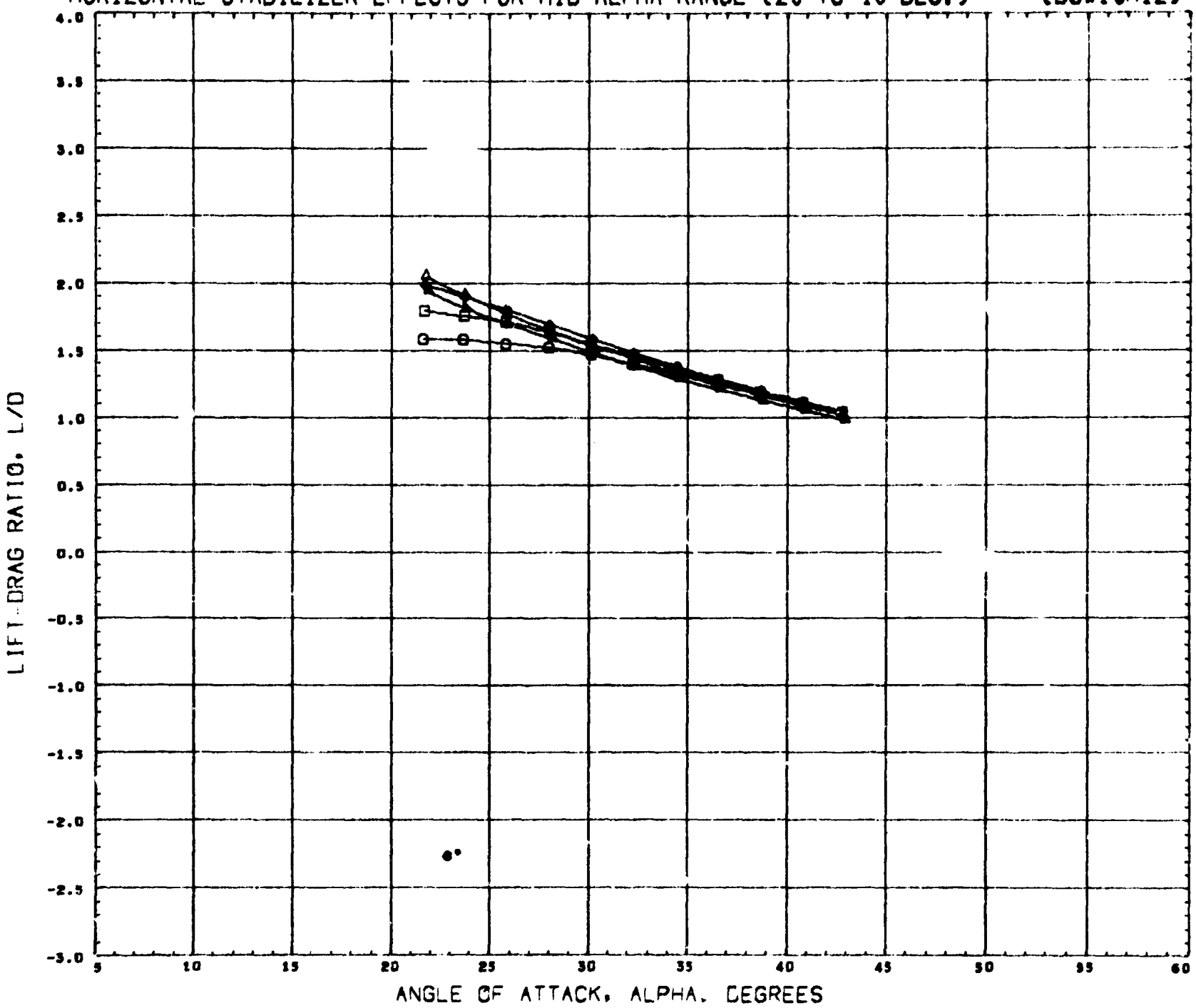


SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	4.959	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▷	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)



SYMBOL	HRZNTL
○	- 40.000
□	- 30.000
◇	- 20.000
△	0.000
▽	10.000

PARAMETRIC VALUES

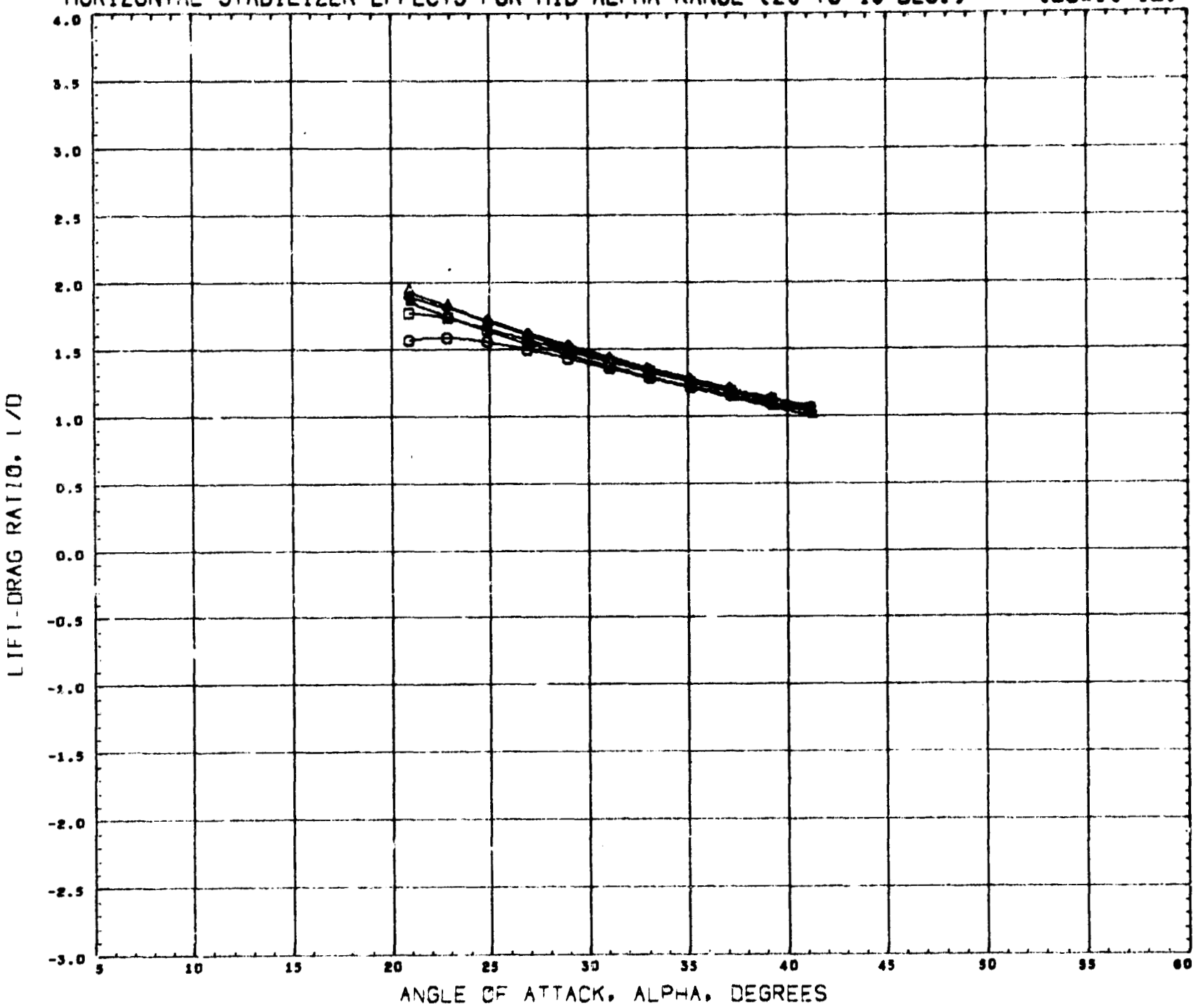
MACH 1.958 BETA 0.010

REFERENCE FILE NA 70 446

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)



SYMBOL	HRZNTL
□	- 40.000
▷	- 30.000
◇	- 20.000
○	0.000
▽	10.000

PARAMETRIC VALUES

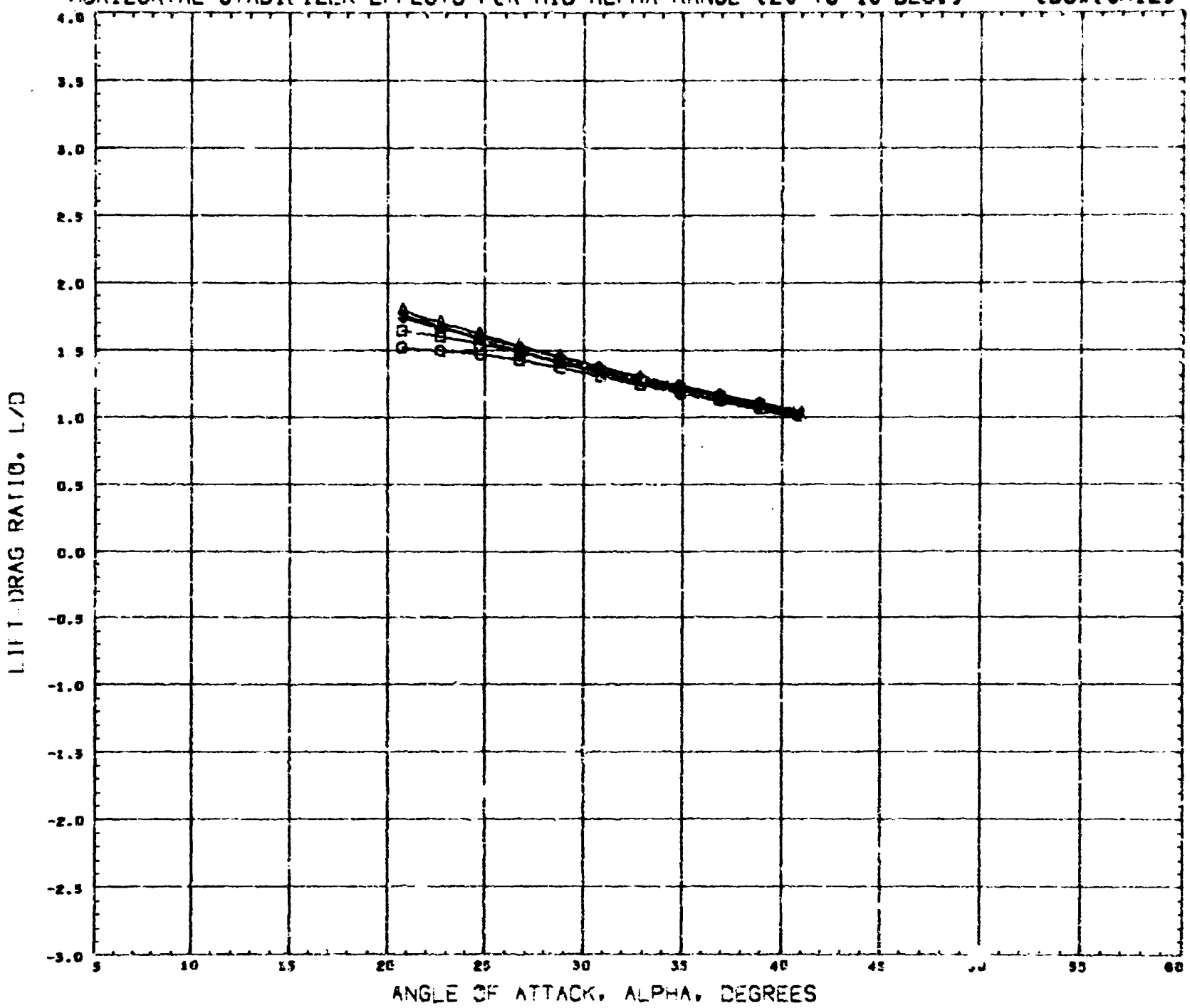
MACH 2.990 BETA 0.010

REFERENCE FILE NA 70 446

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)

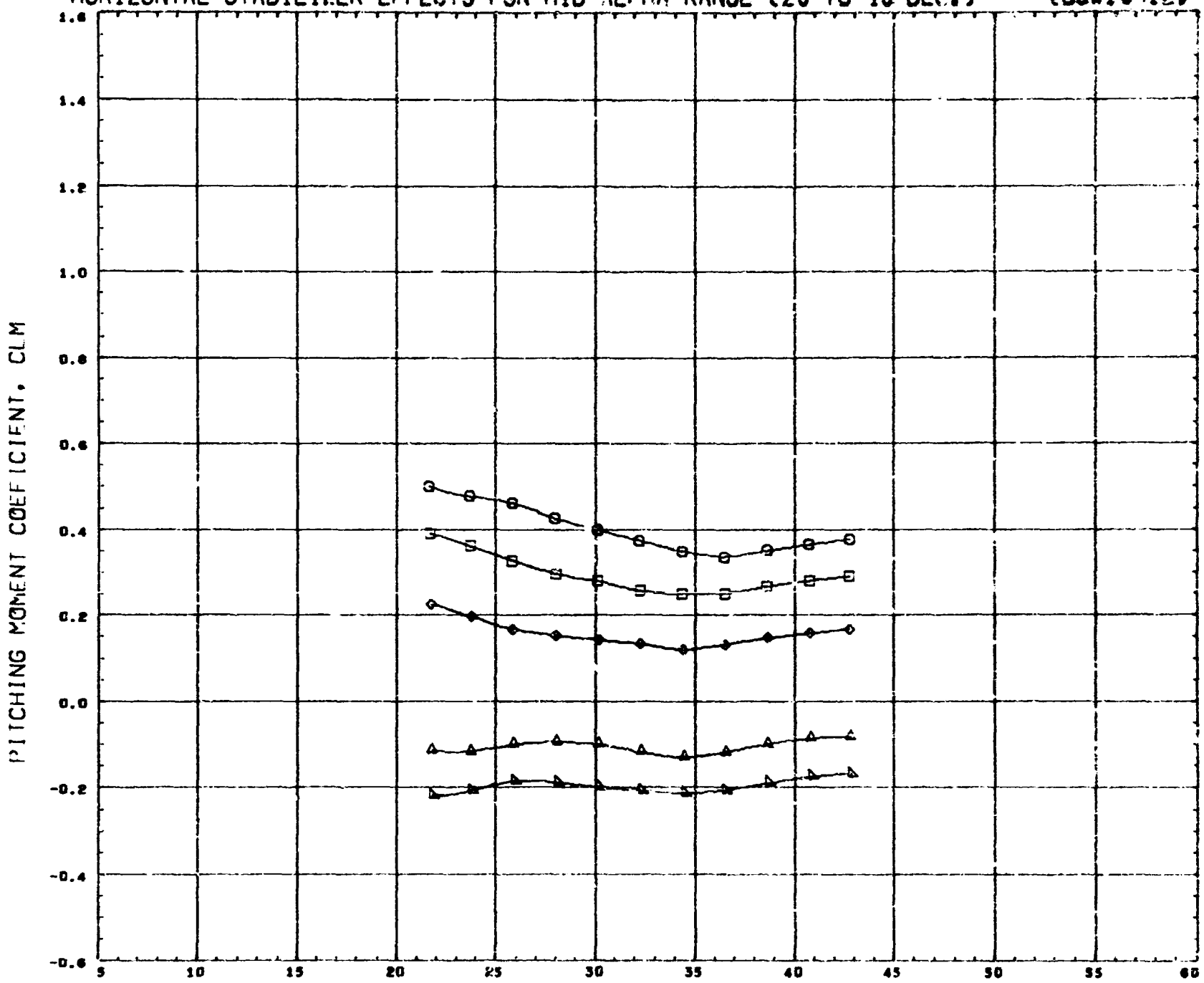


SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	4.959	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▷	[illegible]				

REFERENCE FILE NA 70 446

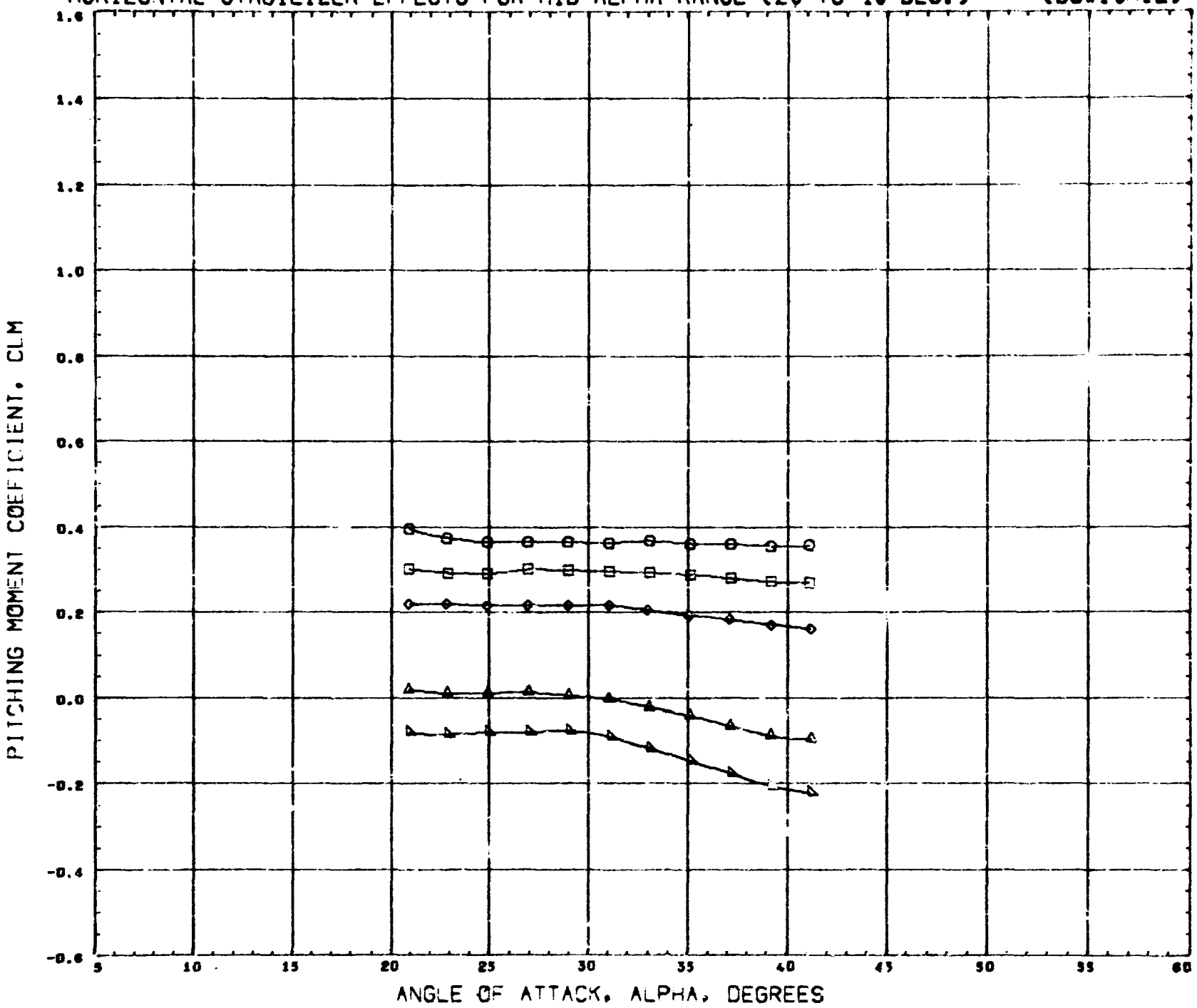
REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	1.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W1OH12)



SYMBOL	HRZNTL	PARAMETRIC VALUES				REFERENCE INFORMATION		
O	- 40.000	MACH	1.958	BETA	0.010	REFS	5.4460	SQINCH
□	- 30.000					REFL	1.1300	INCHES
◇	- 20.000					REFB	5.2150	INCHES
△	0.000					XMRP	4.5260	INCHES
◊	10.000					YMRP	0.0000	INCHES
						ZMRP -	0.17.0	INCHES
		REFERENCE FILE		NA 70 446		SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W1OH12)

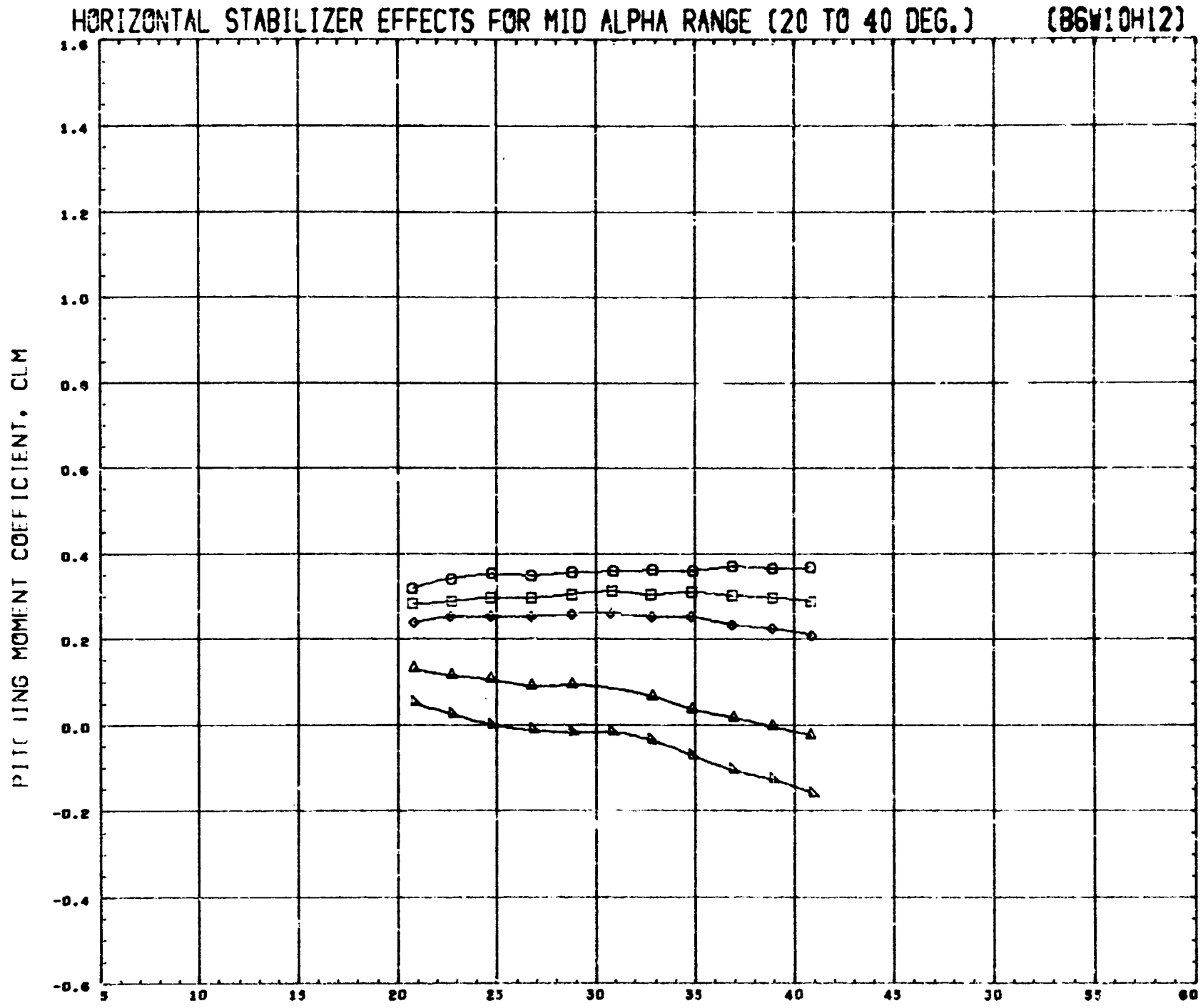


SYMBOL	MRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	2.990	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▷	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1700	INCHES
SCALE	0.0035	SCALE



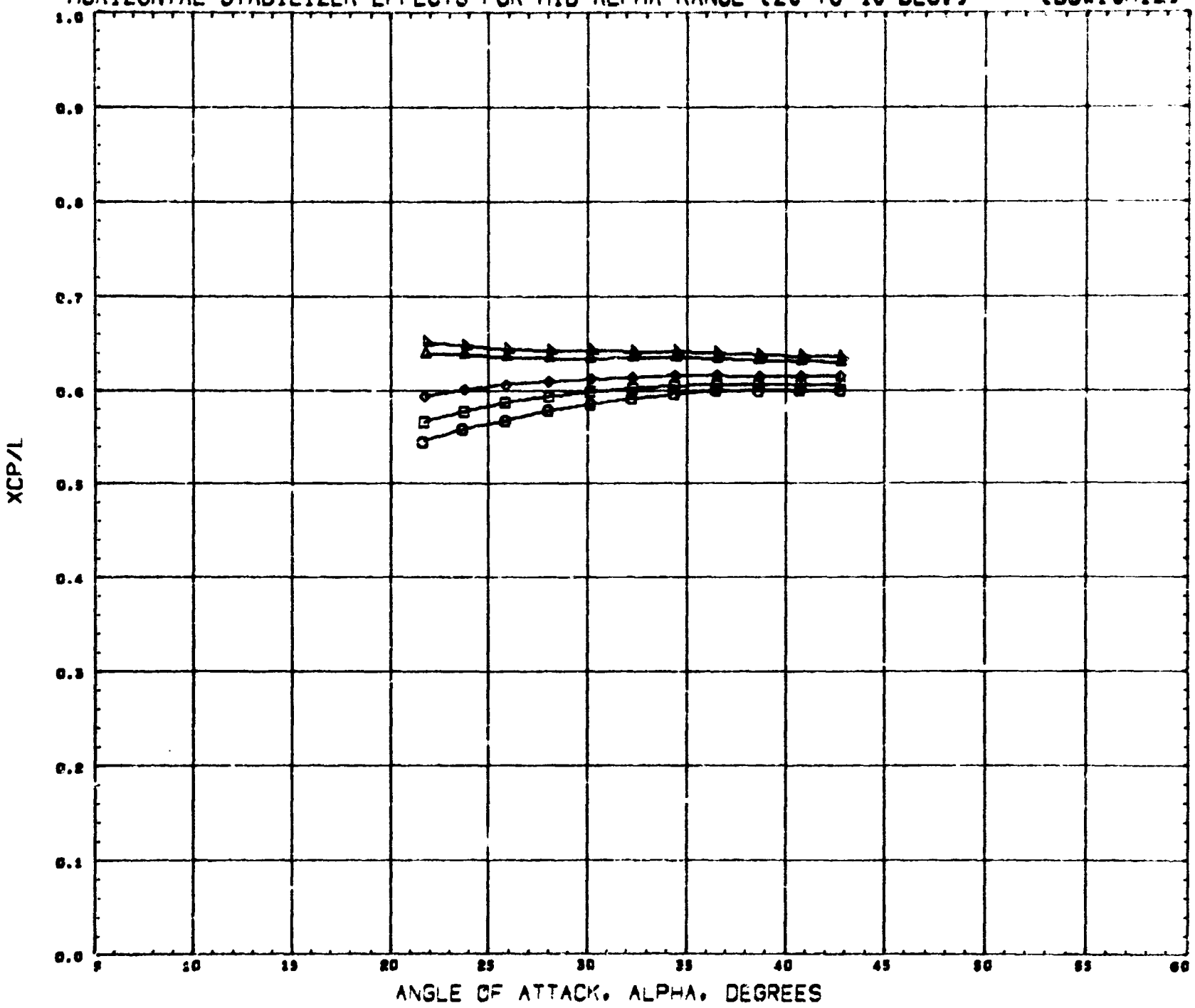
SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	4.959	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▷	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)

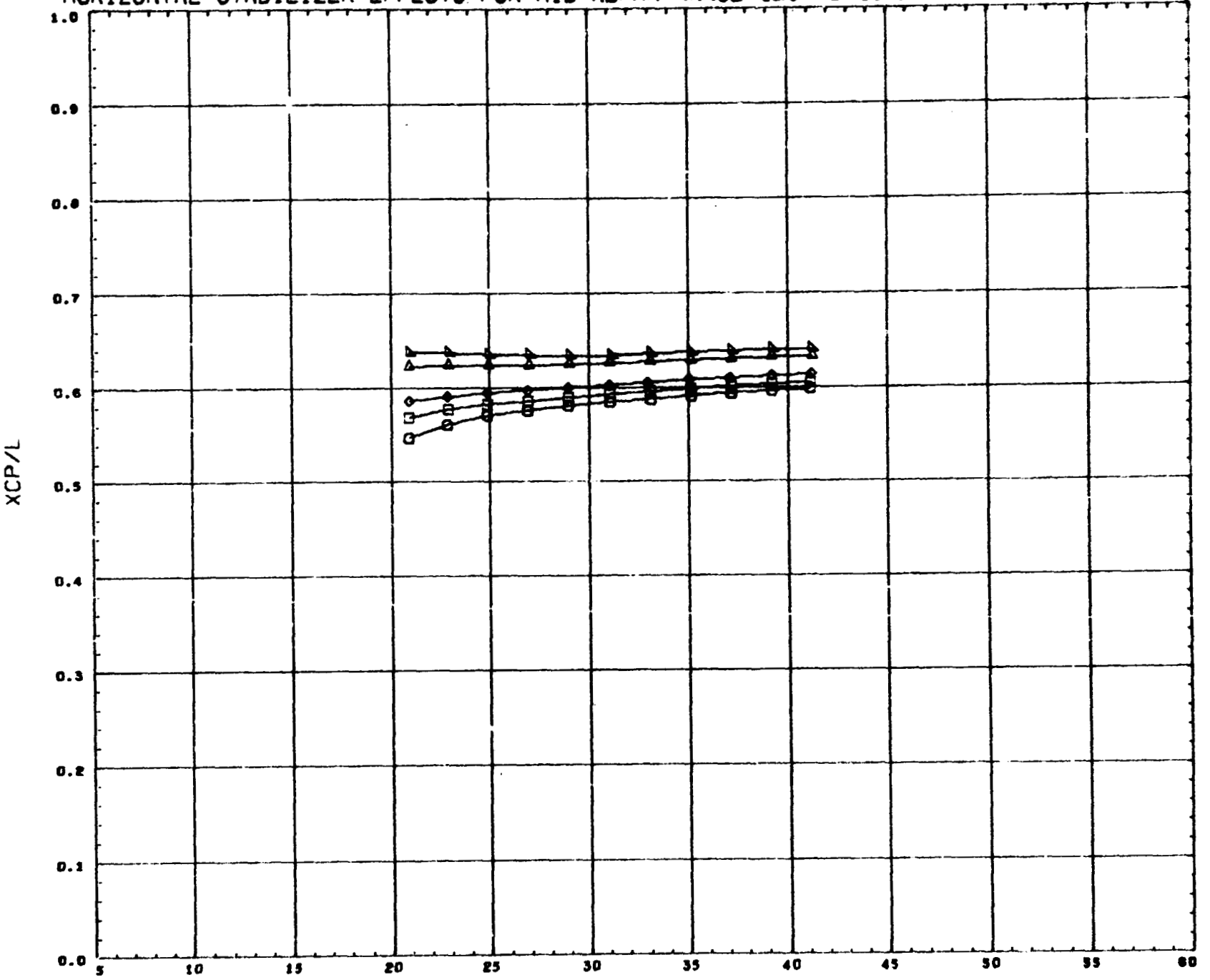


SYMBOL	MRZNTL	PARAMETRIC VALUES			
□	- 40.000	MACH	1.958	BETA	0.010
◇	- 30.000				
△	- 20.000				
▽	0.000				
	10.000				

REFERENCE FILE NA 70 448

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0055	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)



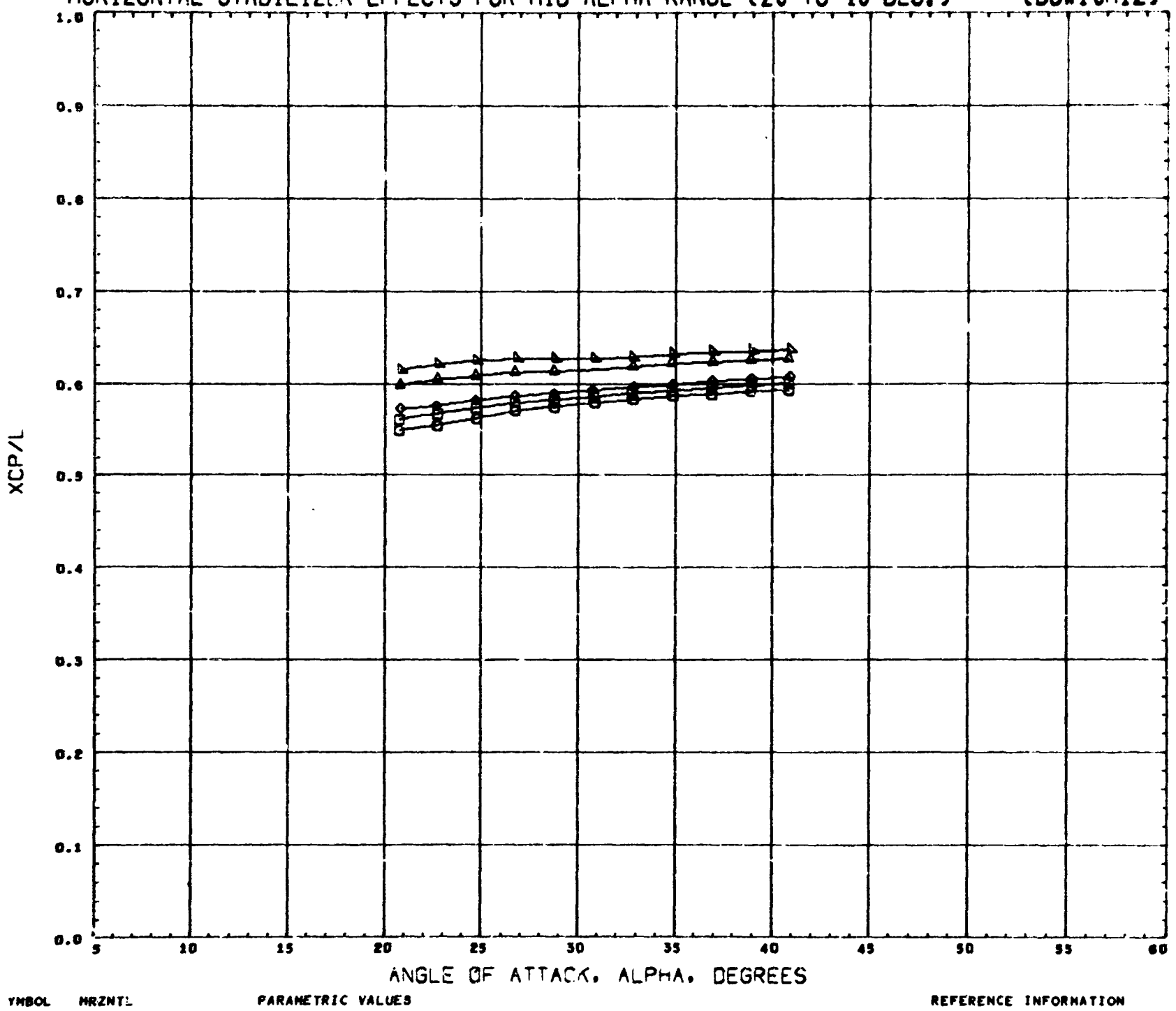
SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	2.990	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▷	10.00				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)

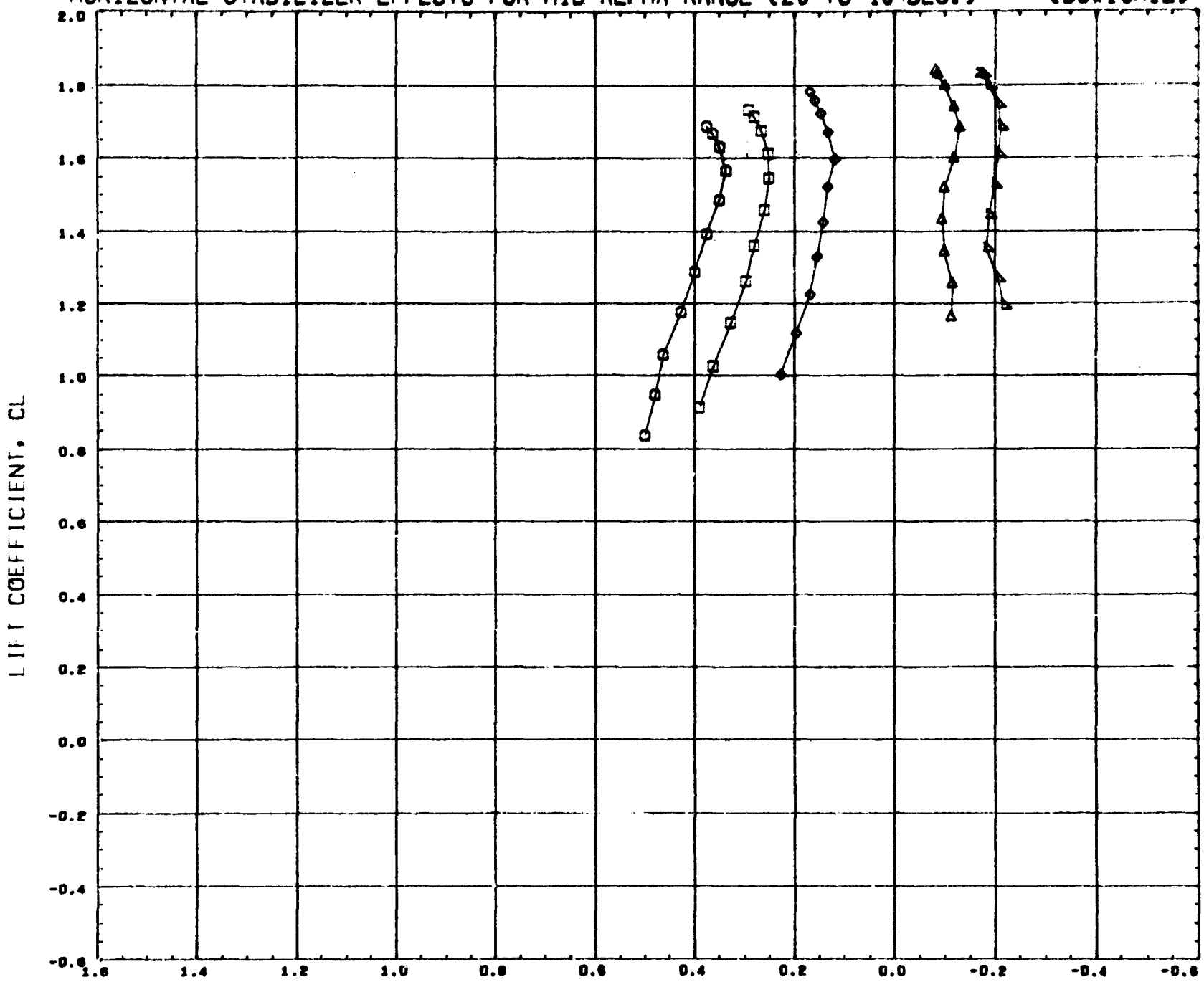


SYMBOL	MRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	4.959	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▽	10.000				

REFERENCE FILE NA 76 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)

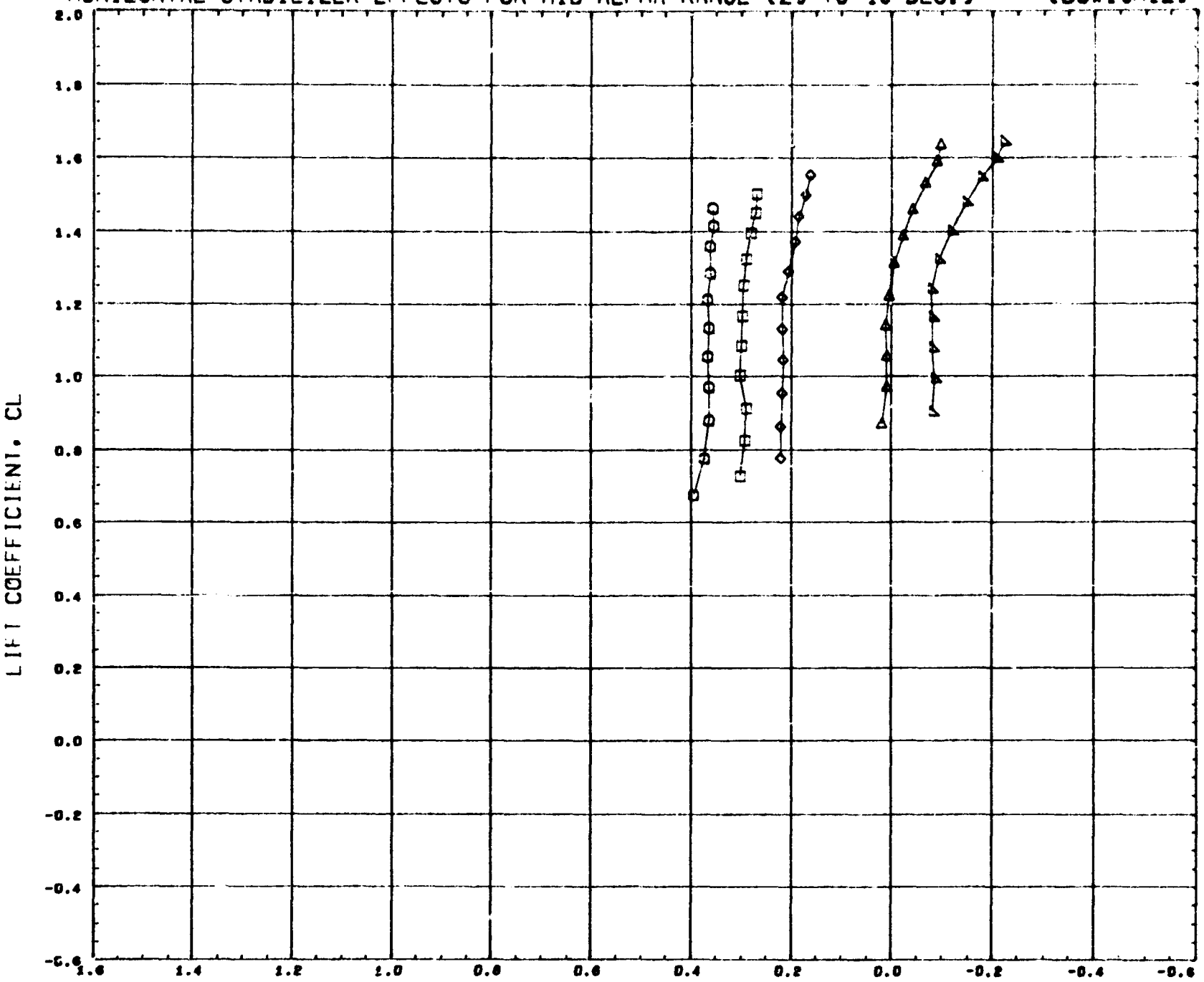


SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	1.958	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▽	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1760	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)



SYMBOL	HRZNTL
○	- 40.000
□	- 30.000
◇	- 20.000
△	0.000
▽	10.000

PARAMETRIC VALUES

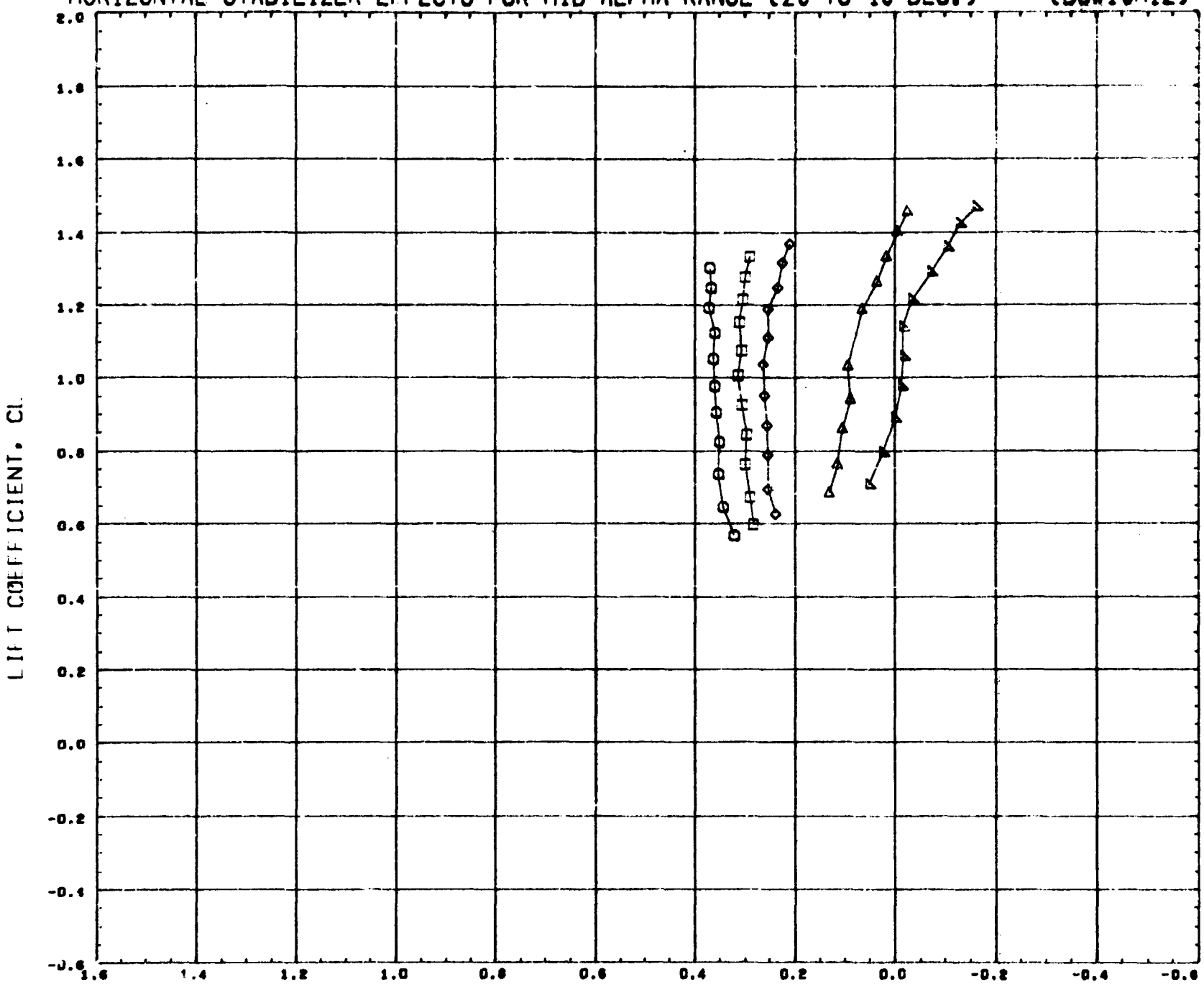
MACH 2.990 BETA 0.010

REFERENCE FILE NA 70 446

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)

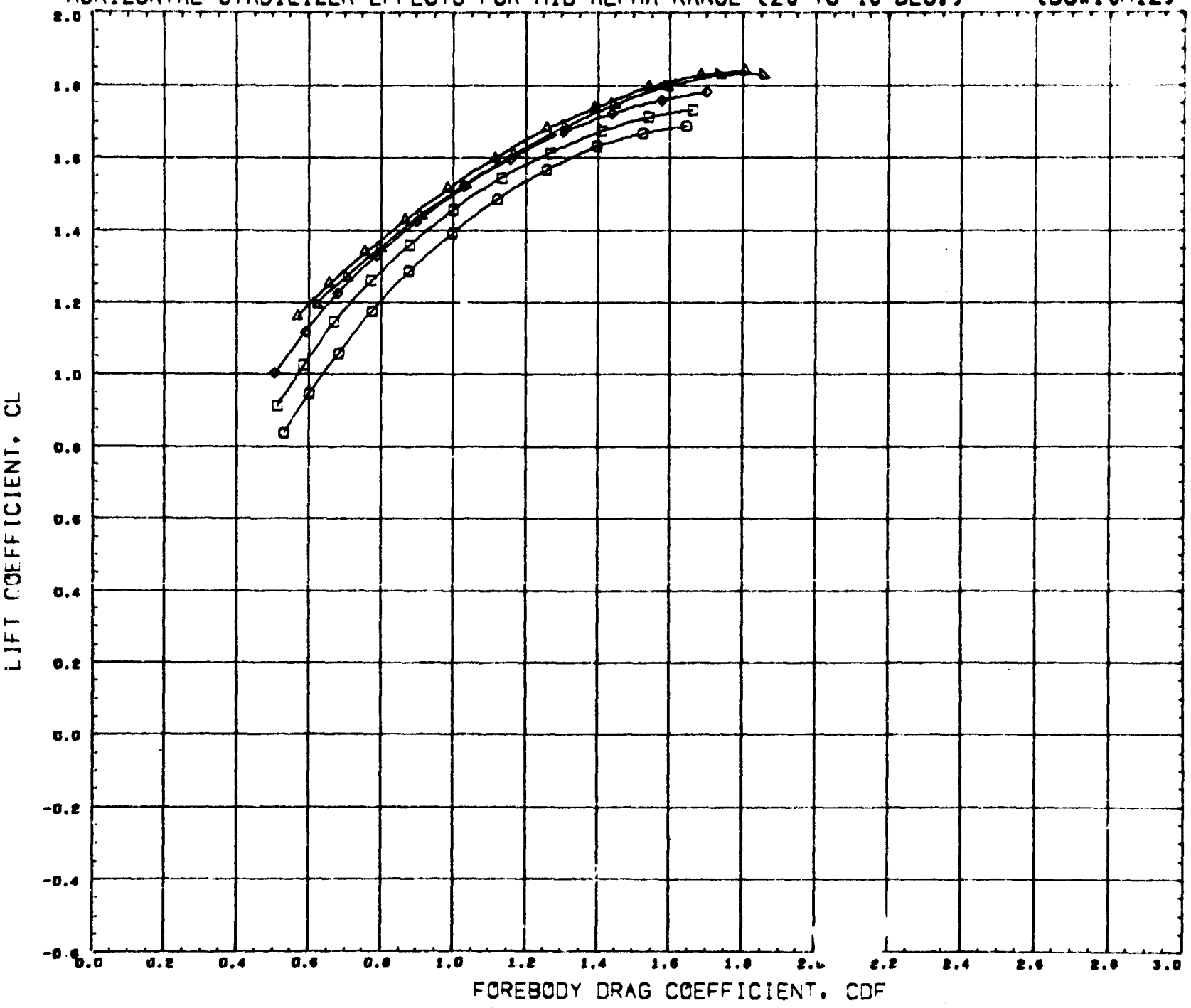


SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	4.959	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▷	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)



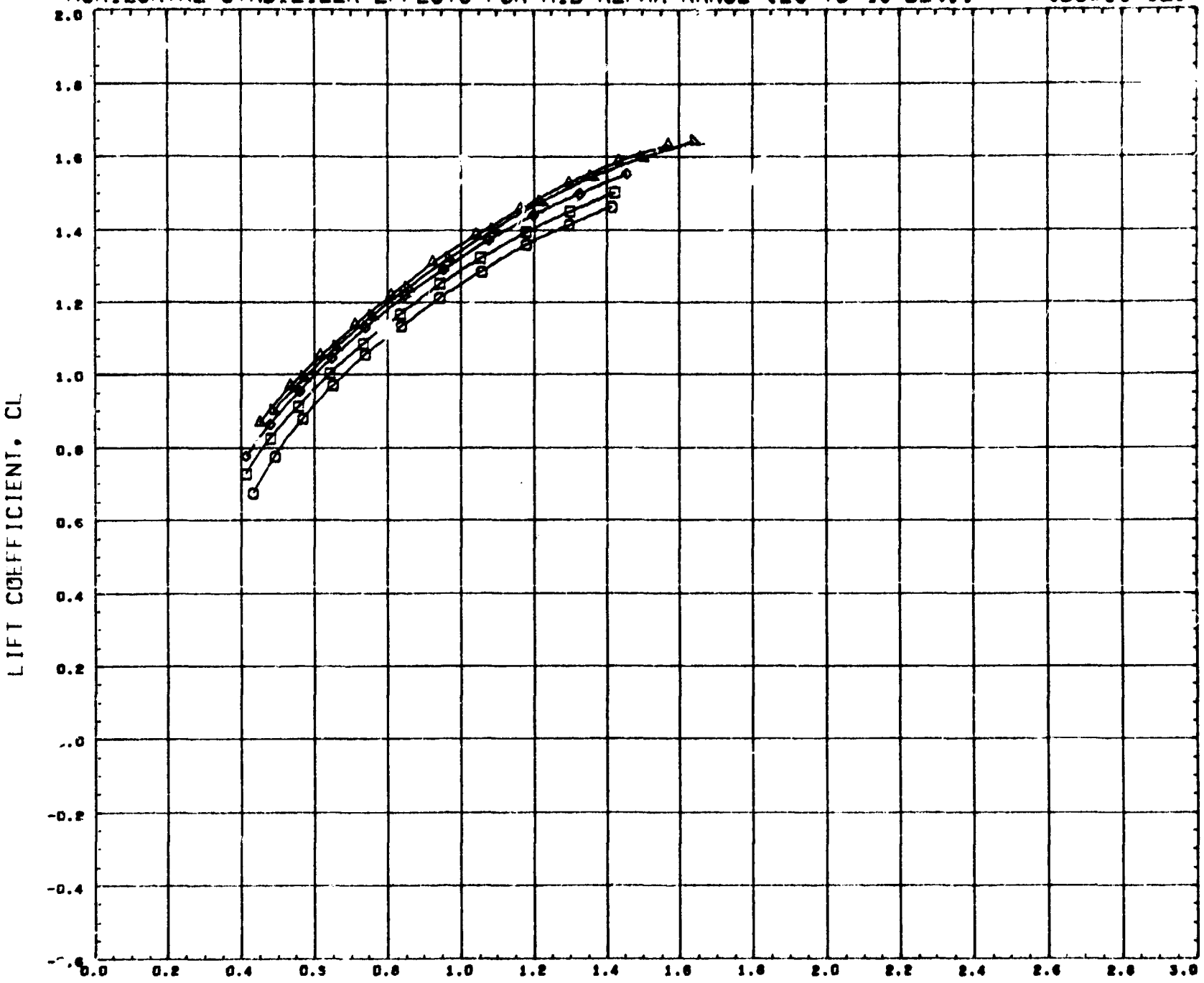
SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 40.000	MACH	1.958	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▷	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

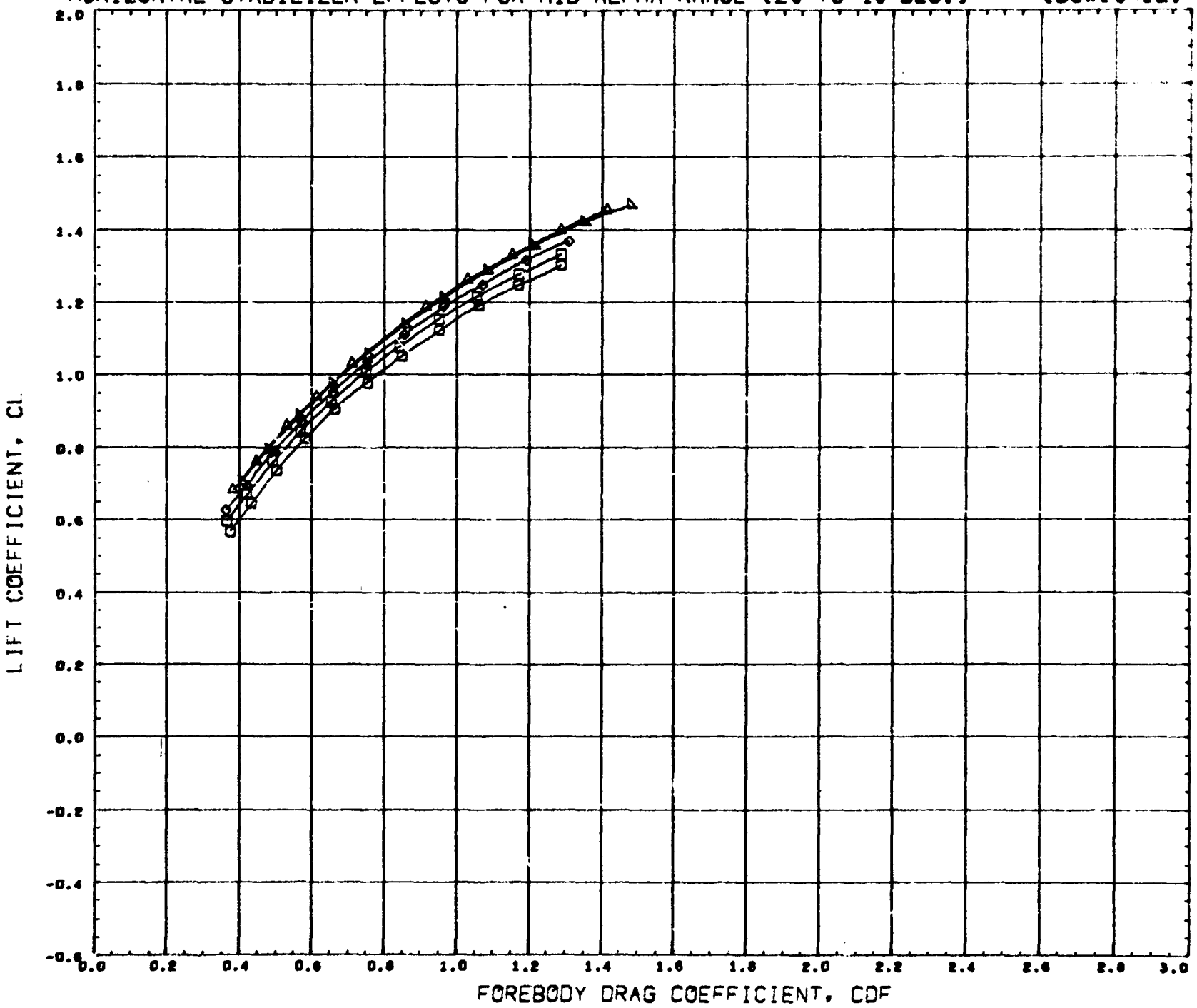
HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)



SYMBOL	HRZNTL	PARAMETRIC VALUES				REFERENCE INFORMATION		
○	- 40.000	MACH	2.990	BETA	0.010	REFS	5.4480	SQINCH
□	- 30.000					REFL	1.1300	INCHES
◇	- 20.000					REFB	5.2150	INCHES
△	0.000					XMRP	4.5260	INCHES
▷	10.000					YMRP	0.0000	INCHES
						ZMRP -	0.1780	INCHES
						SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

HORIZONTAL STABILIZER EFFECTS FOR MID ALPHA RANGE (20 TO 40 DEG.) (B6W10H12)

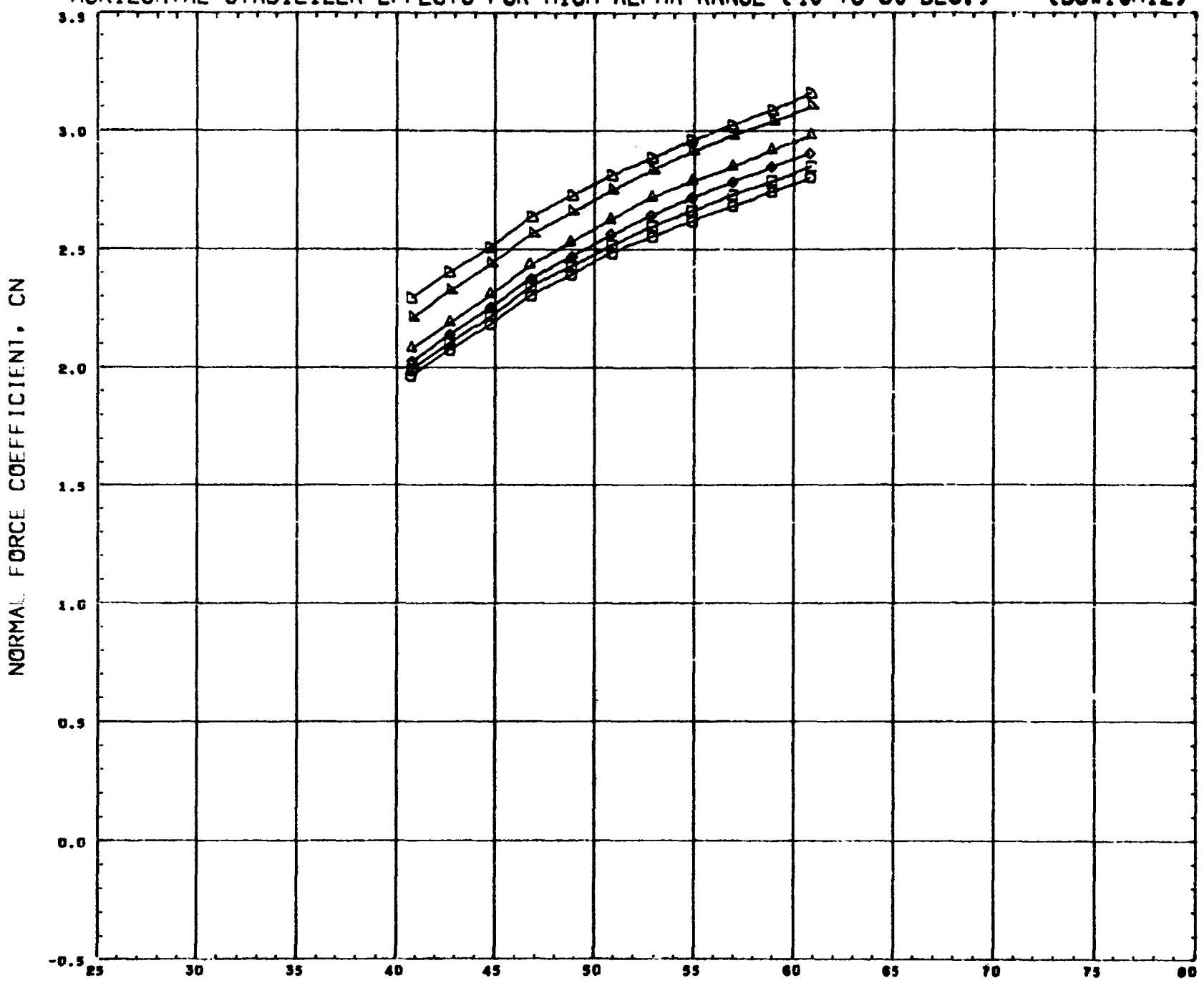


SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 40.000	MACH	4.959	BETA	0.010
□	- 30.000				
◇	- 20.000				
△	0.000				
▷	10.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

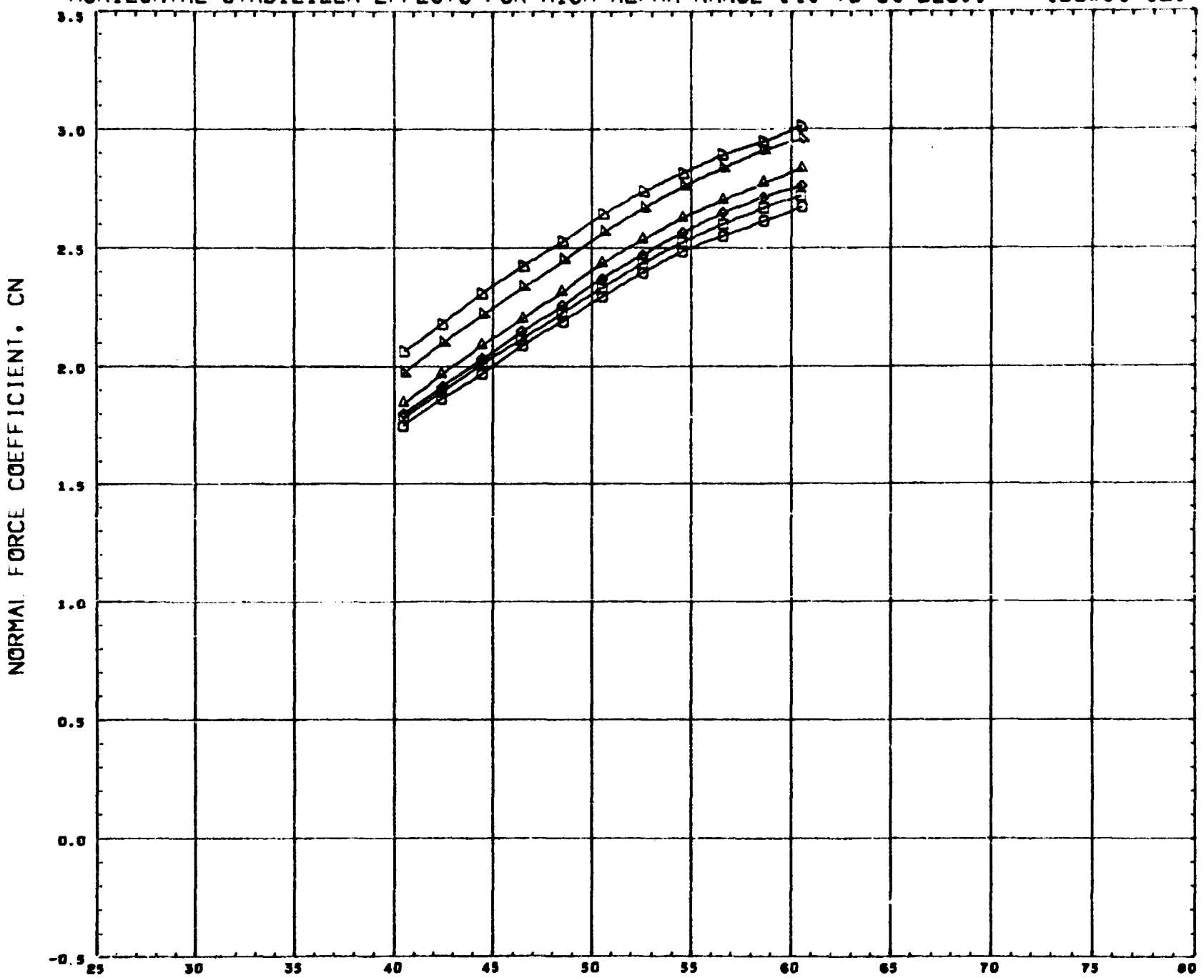
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 50.000	MACH	2.990	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
◁	0.000				
▷	20.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.3260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)

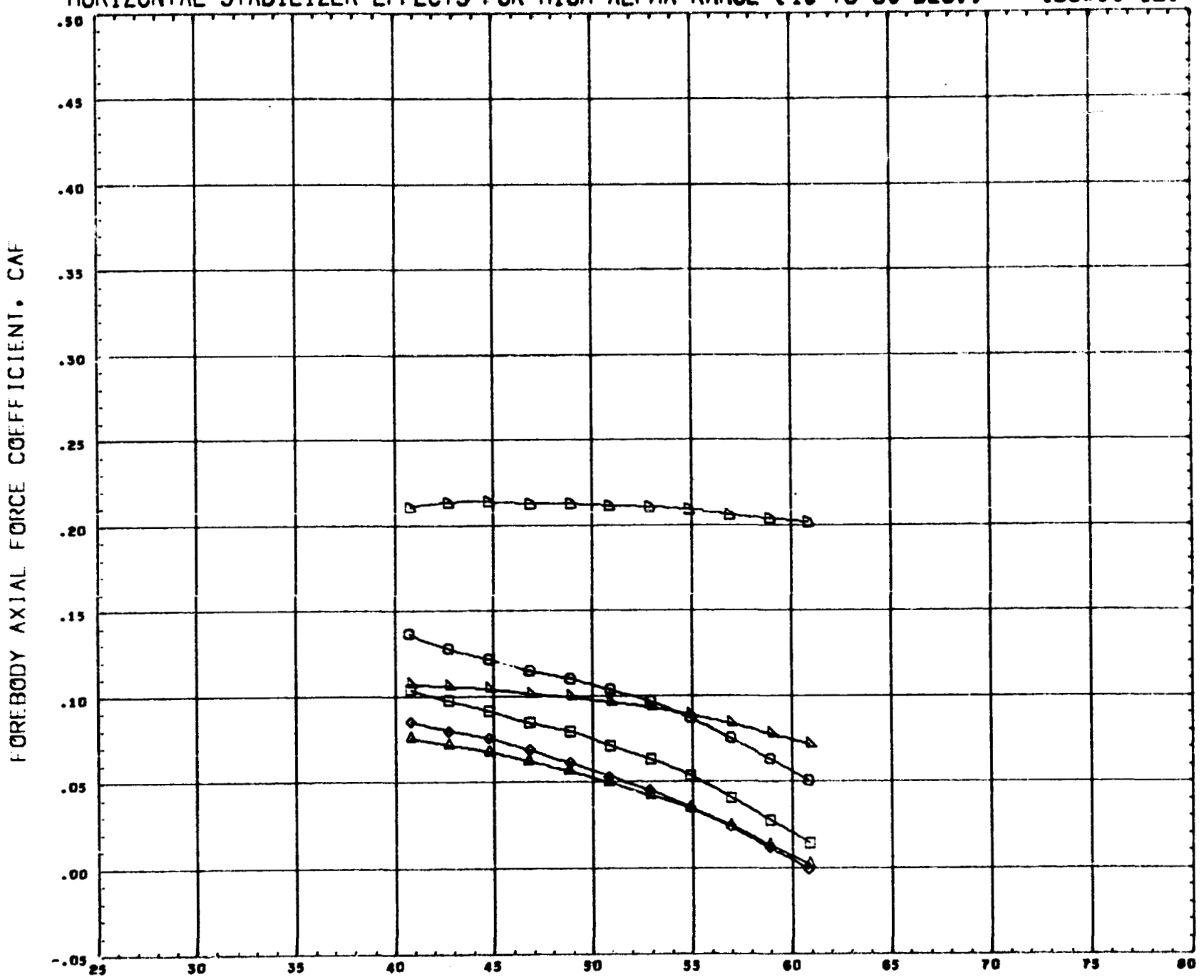


SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 50.000	MACH	4.959	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▷	0.000				
▽	20.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W1OH12)

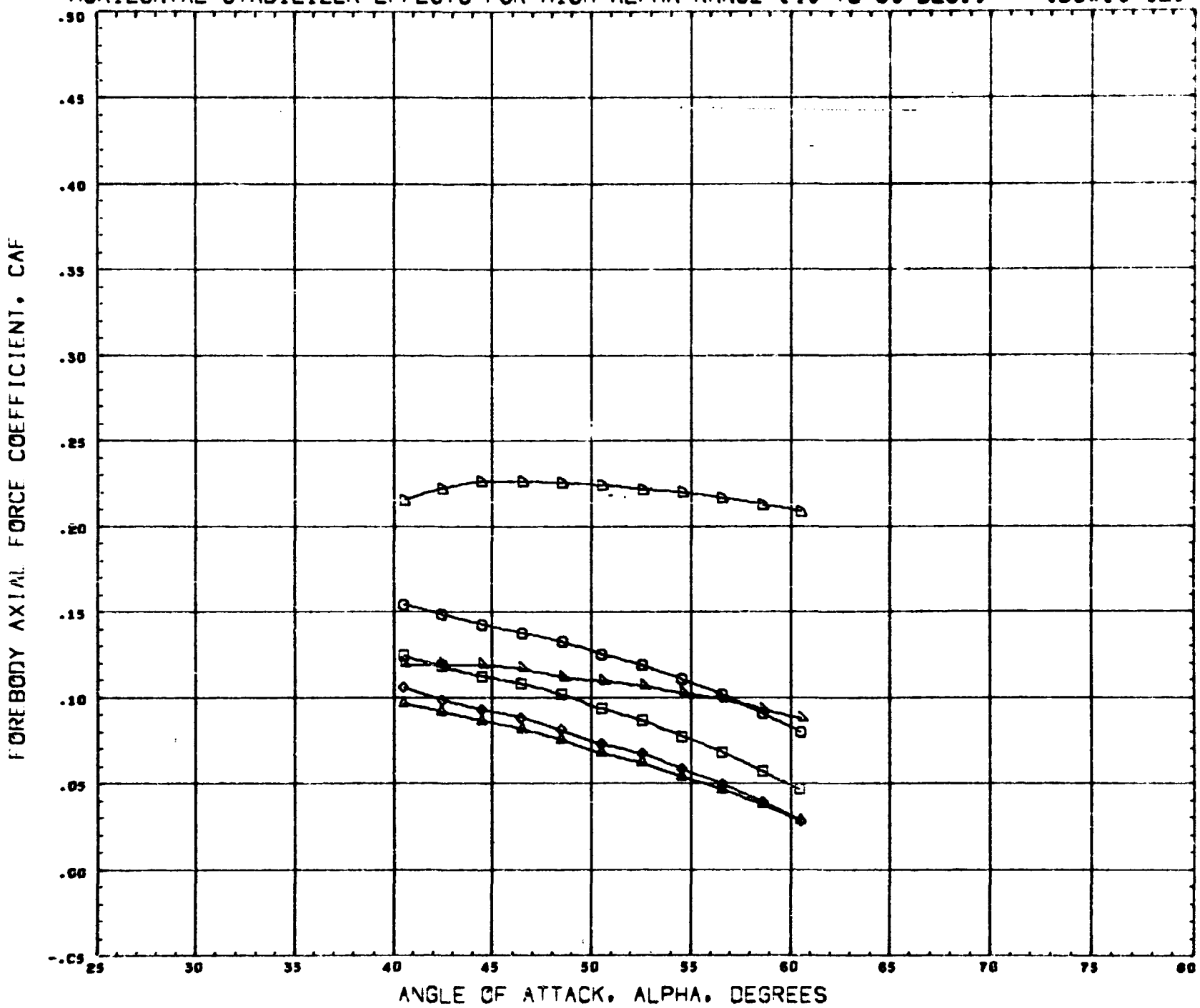


SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 50.000	MACH	2.990	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
⊿	0.000				
⊃	20.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

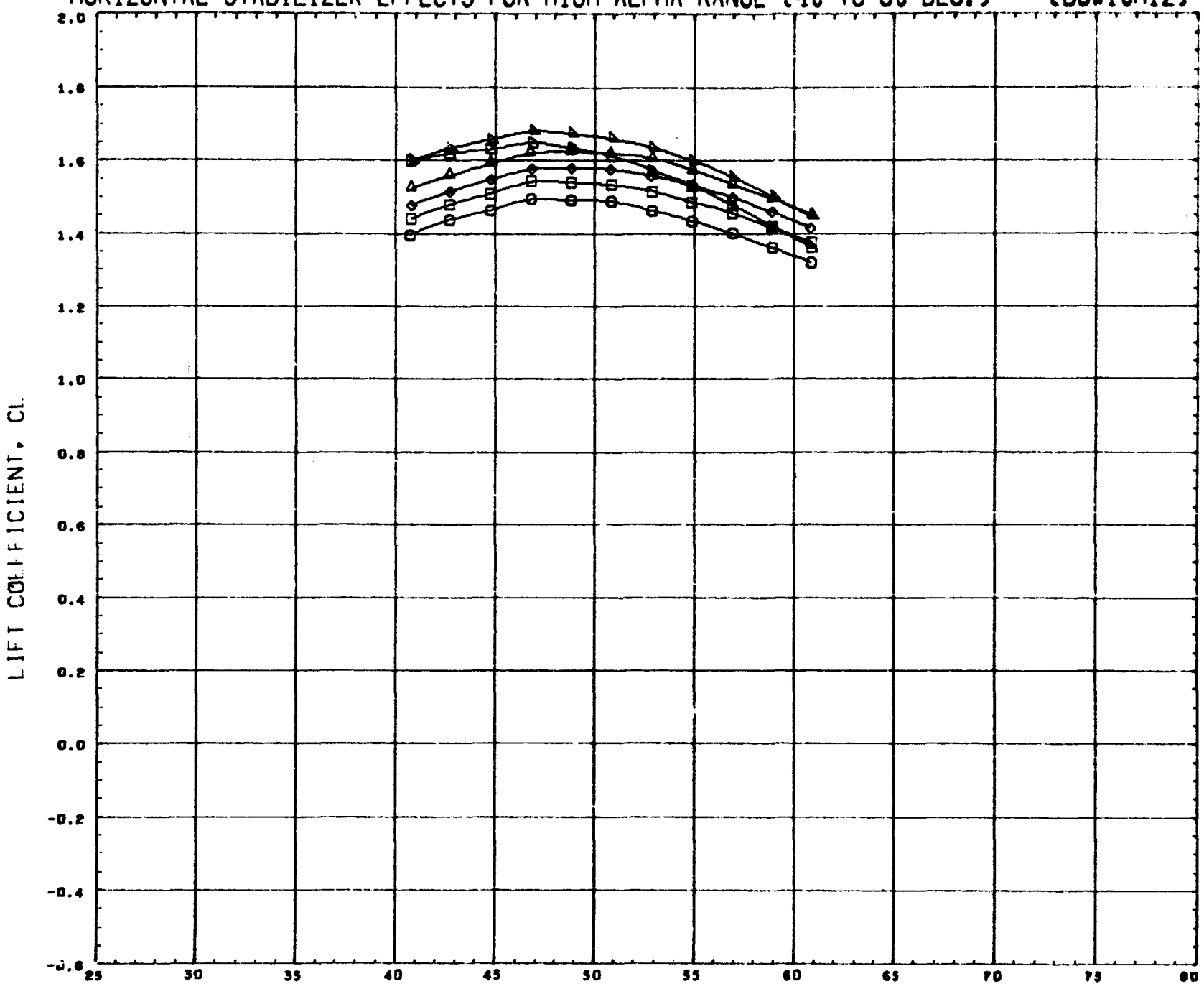
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 50.000	MACH	4.959	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▽	0.000				
▷	20.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

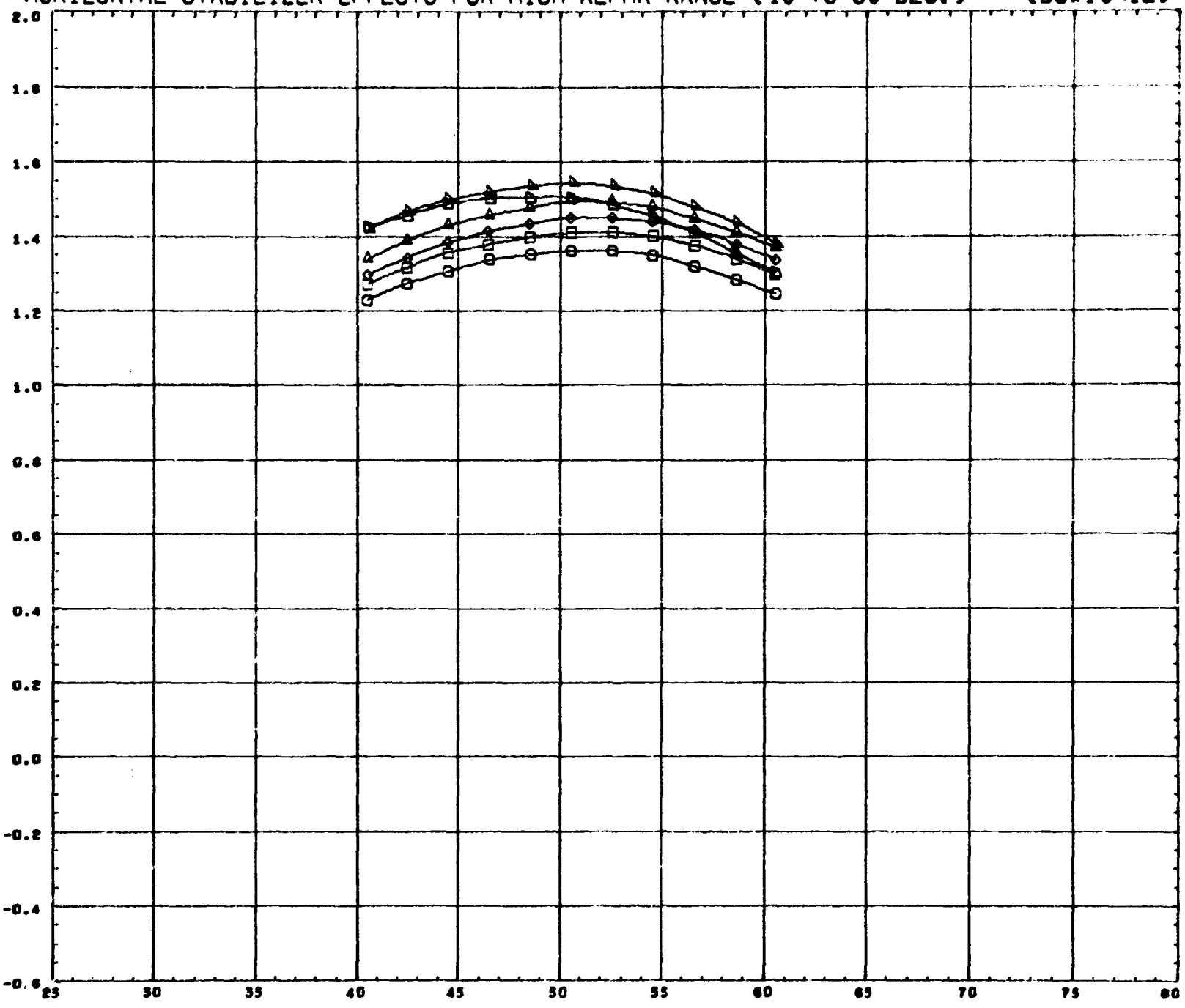
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 50.000	MACH	2.990	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▷	0.000				
D	20.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	$QINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.3260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

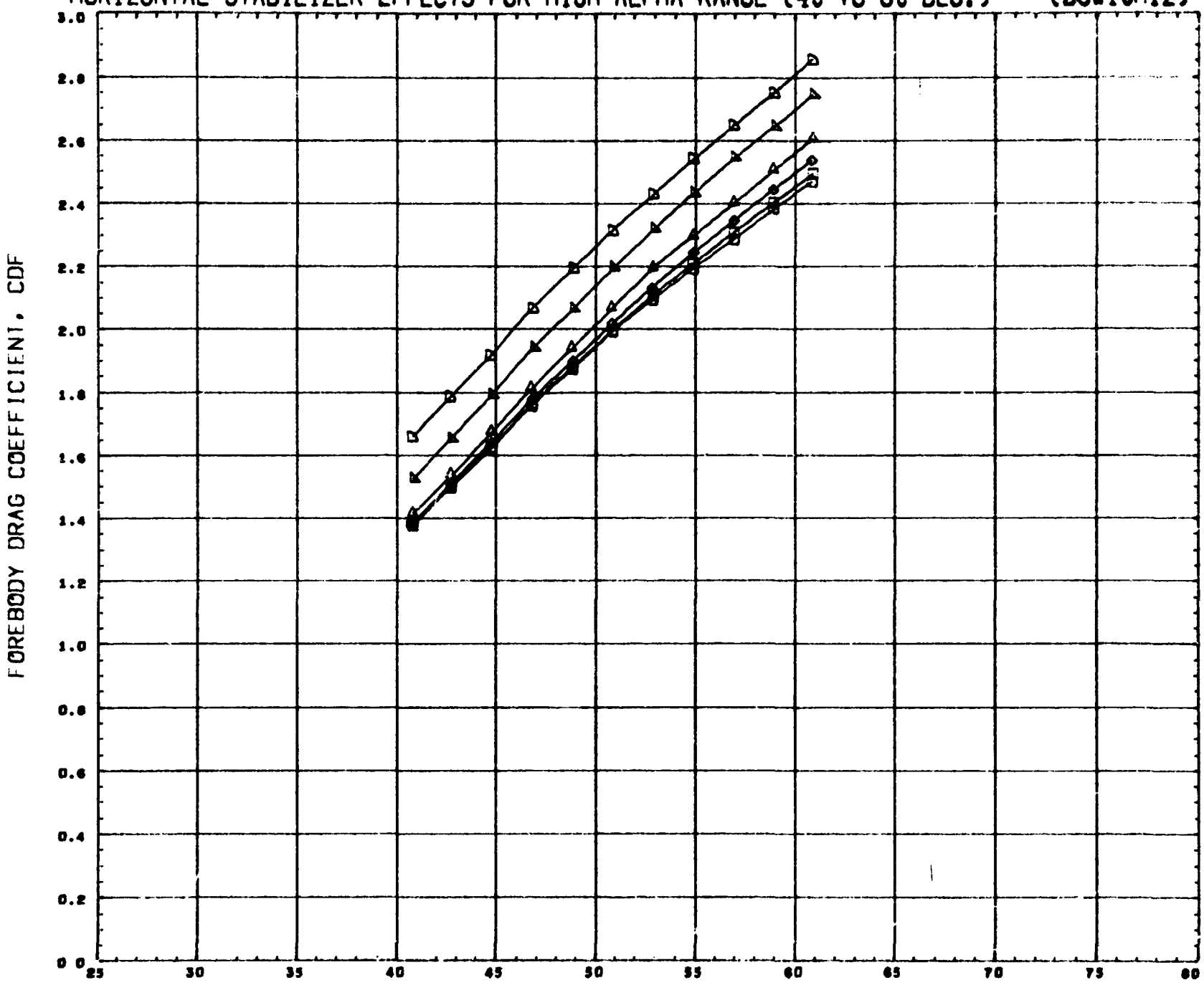
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 50.000	MACH	4.959	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▷	0.000				
▽	20.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	S@INCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	0.1780	INCHES
SCALE	0.0035	SCALE

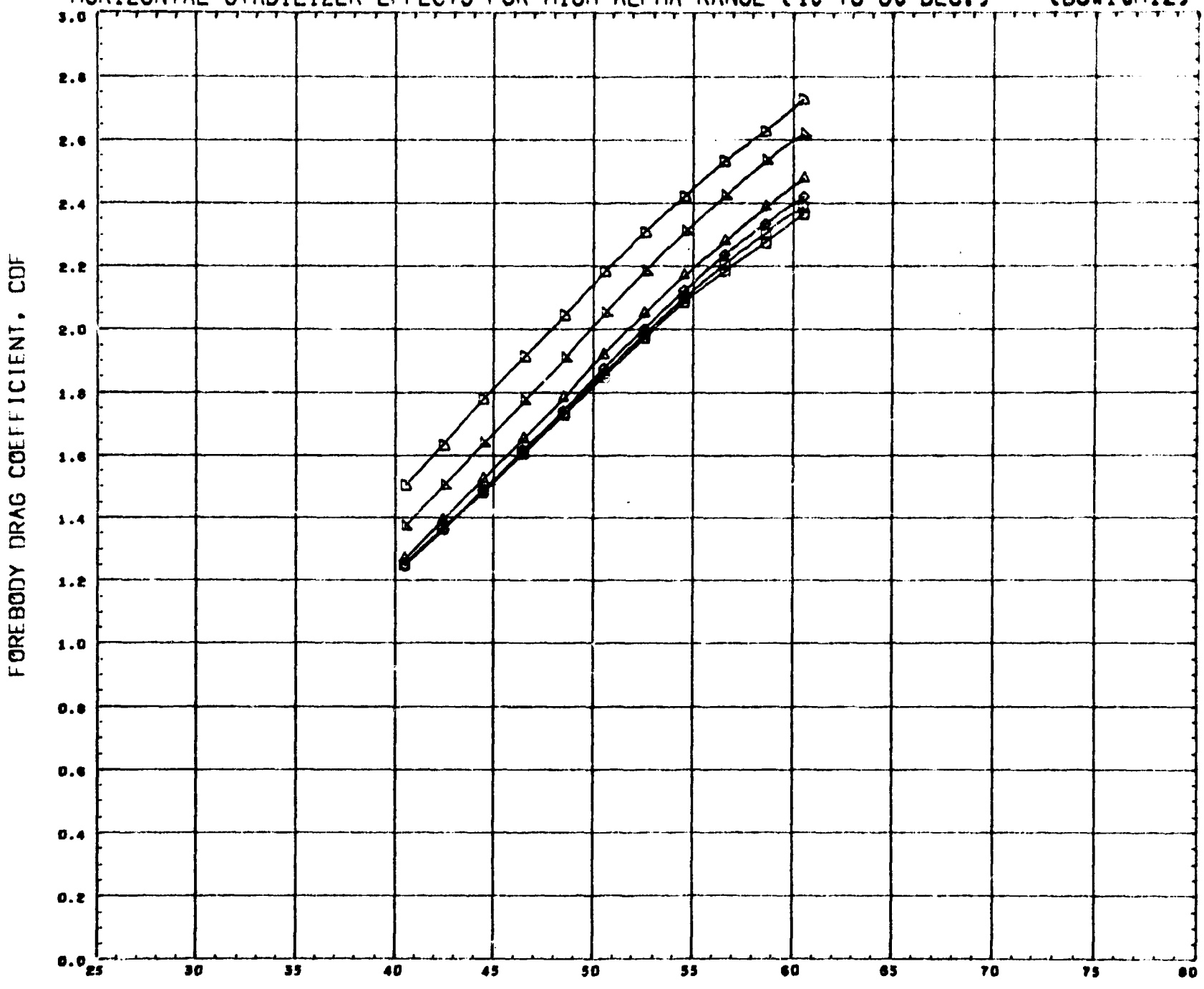
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 50.000	MACH	2.990	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▷	0.000				
D	20.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.8150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1700	INCHES
SCALE	0.0035	SCALE

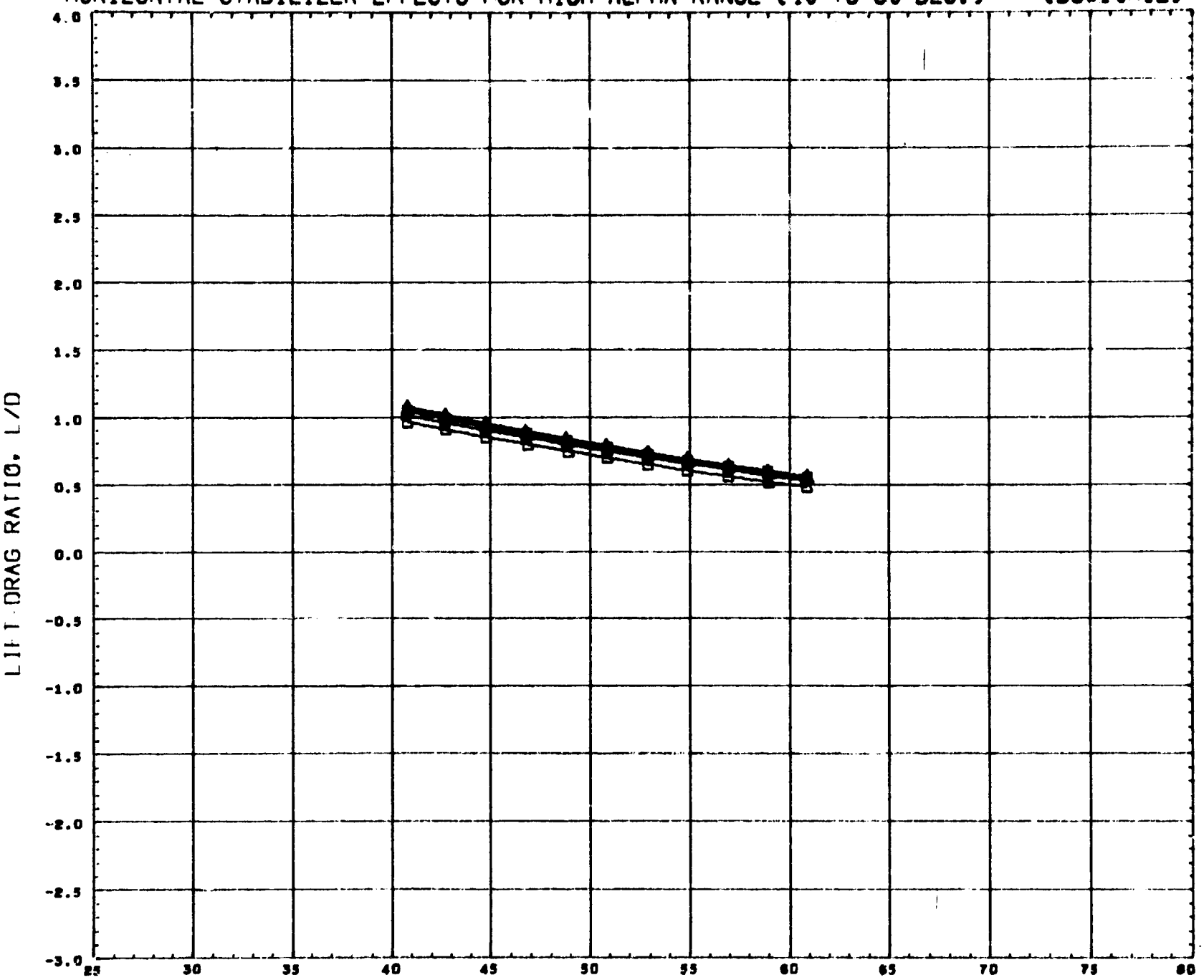
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 50.000	MACH	4.959	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▽	0.000				
▷	20.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

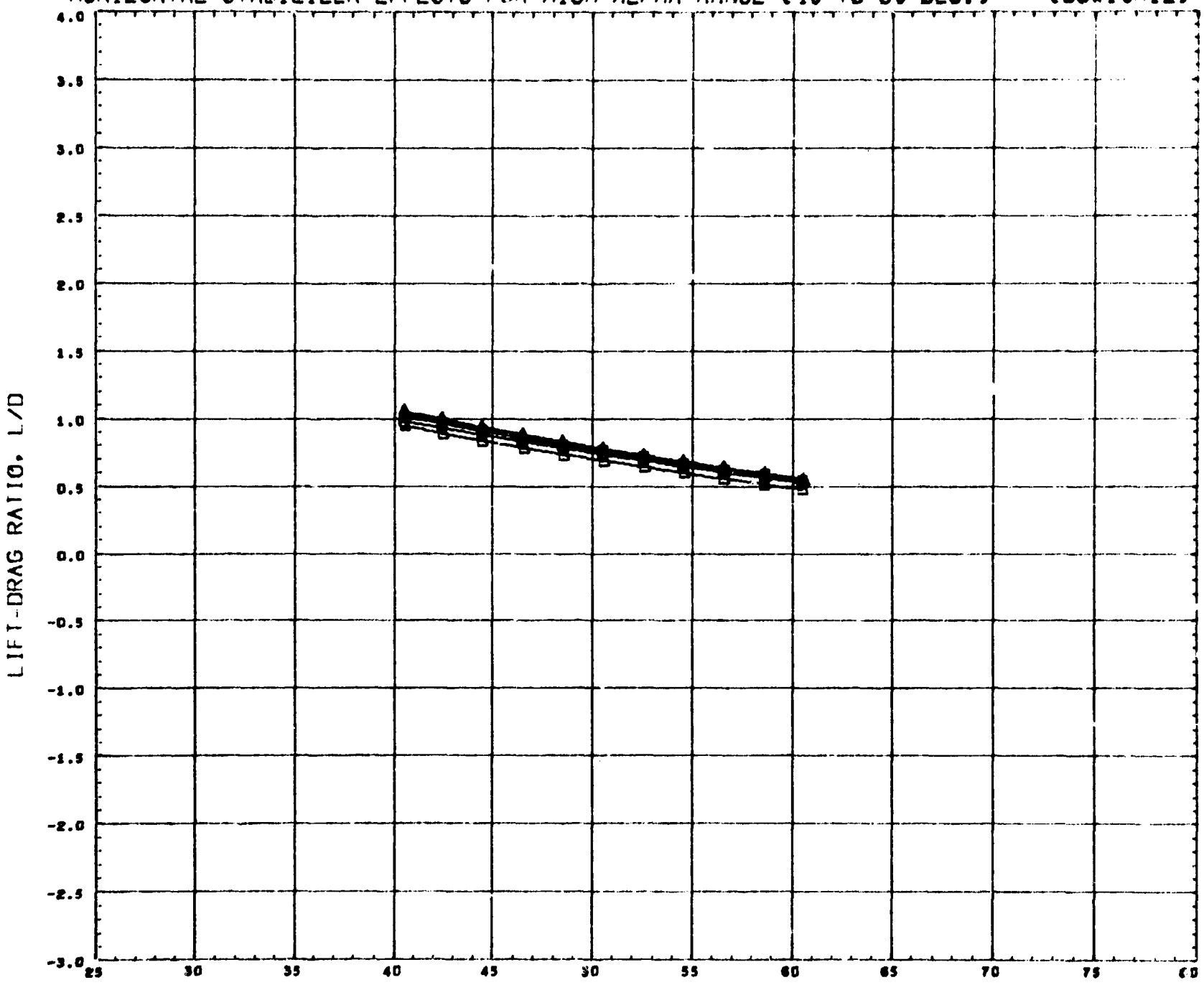
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 50.000	MACH	2.990	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▽	0.000				
▷	20.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

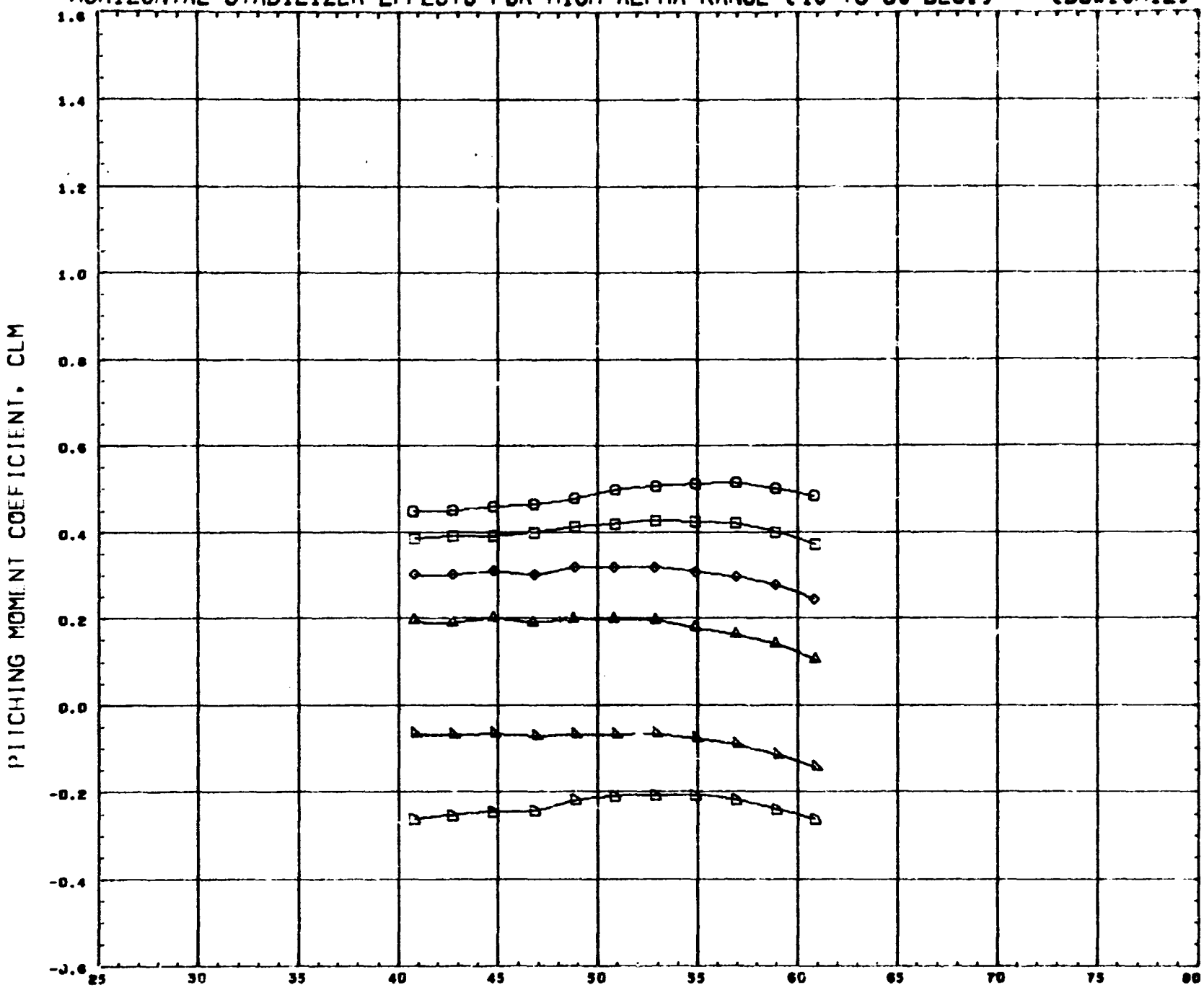
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 50.000	MACH	4.959	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▽	0.000				
⌓	20.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1760	INCHES
SCALE	0.0035	SCALE

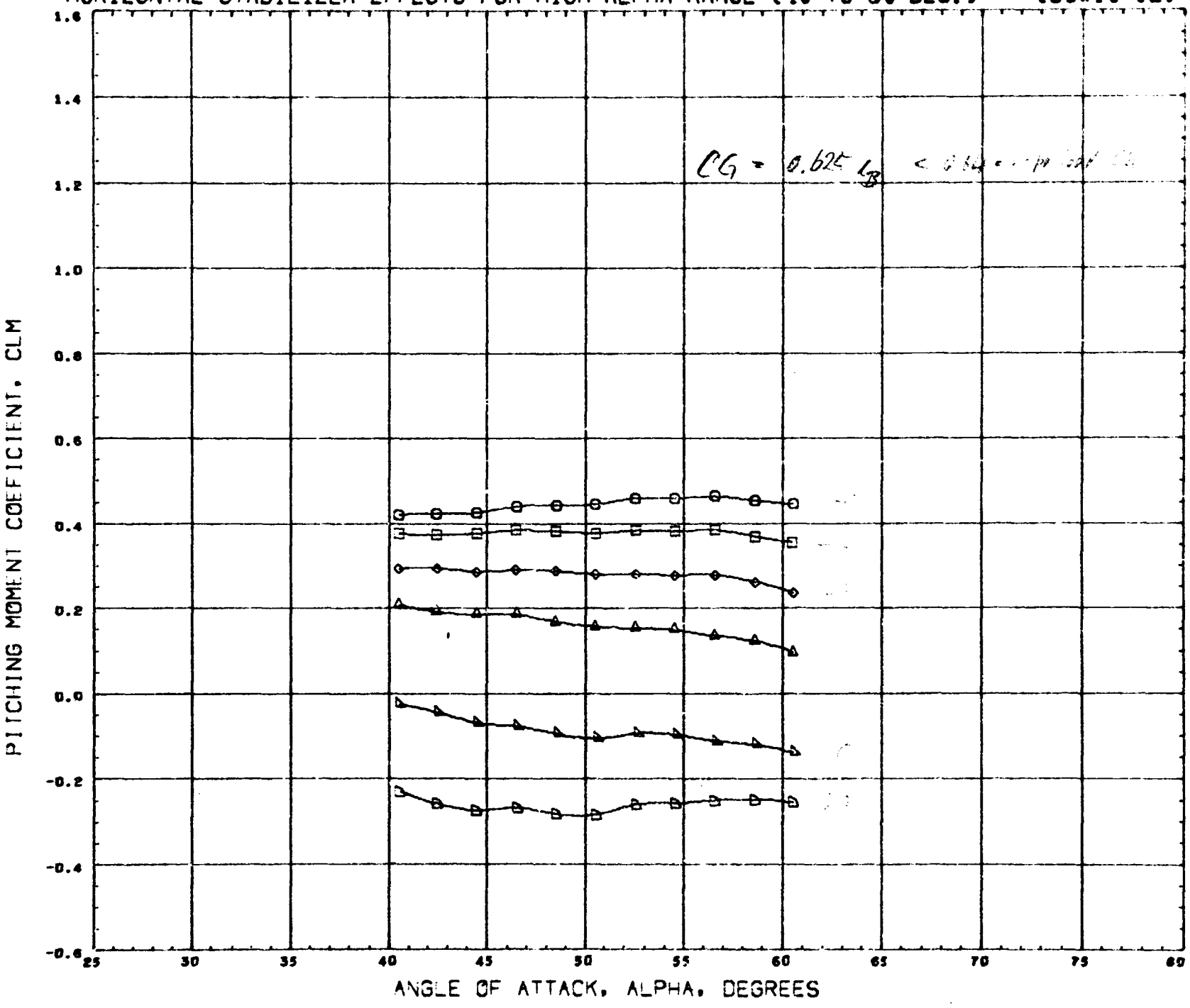
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
O	- 50.000	MACH	2.990	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▷	0.000				
▽	20.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRF	0.0000	INCHES
ZMRP -	0.1783	INCHES
SCALE	0.0035	SCALE

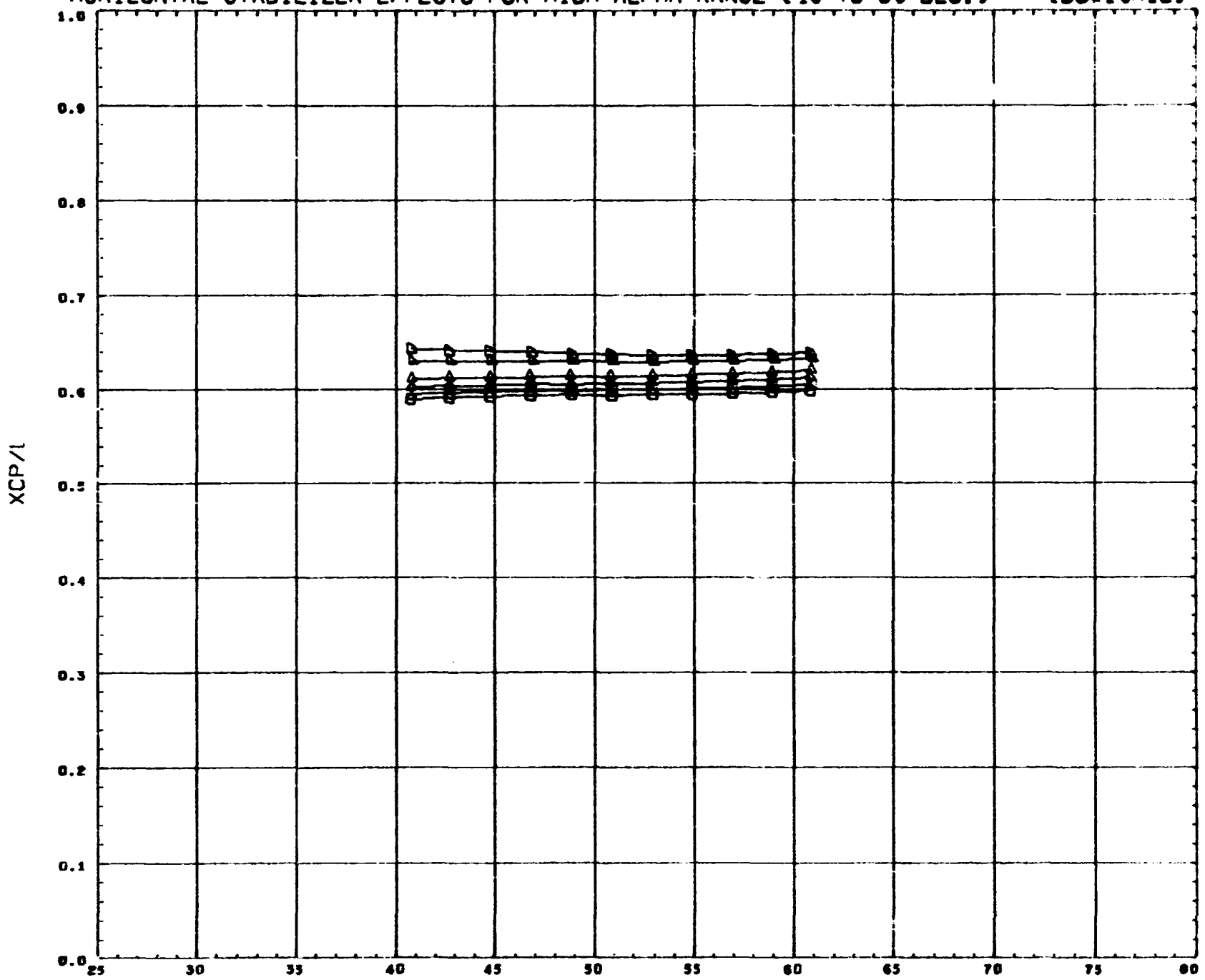
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 50.000	MACH	4.959	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▷	0.000				
▷	20.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

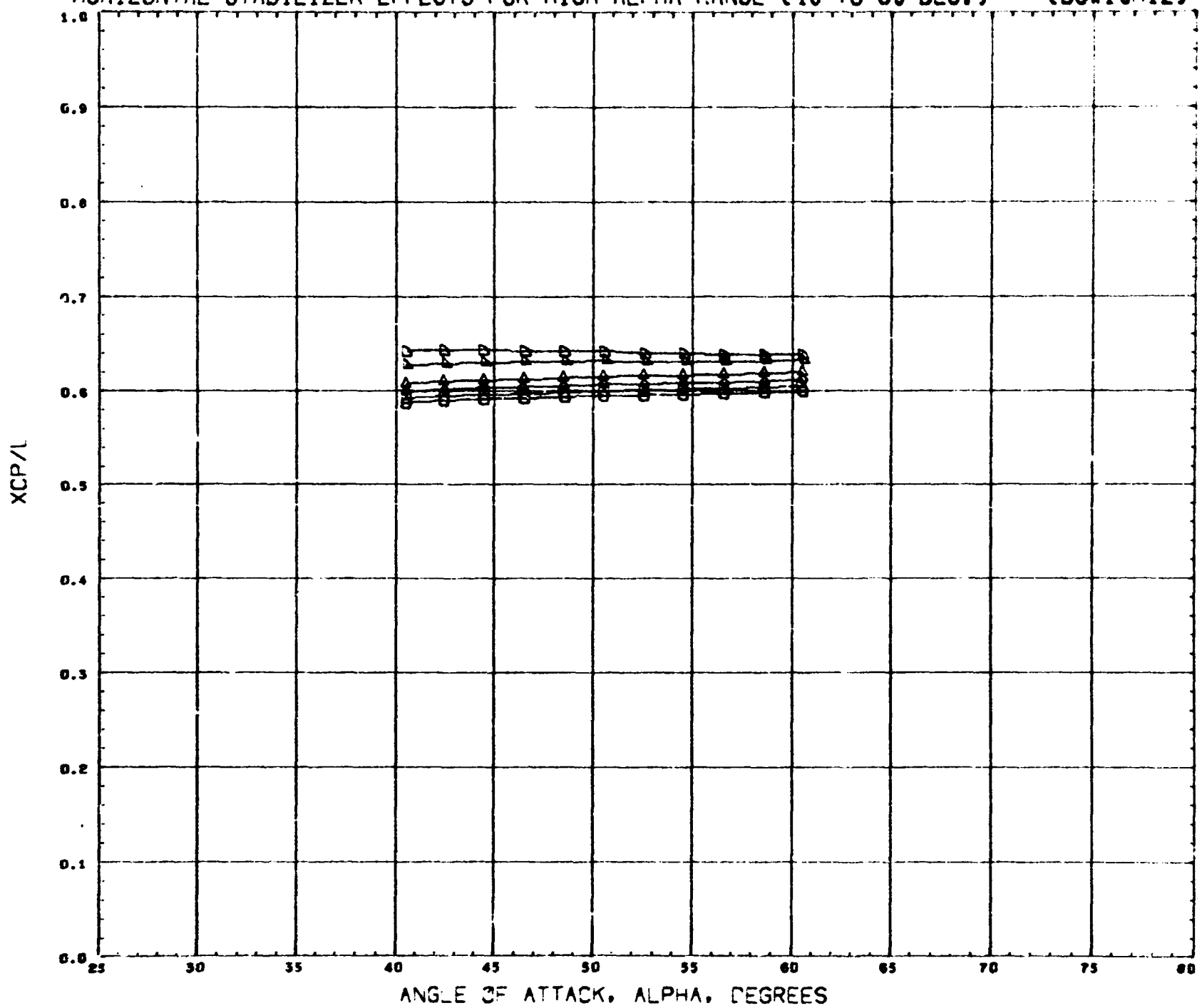
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W1OH12)



SYMBOL	HRZNTL	PARAMETRIC VALUES			
○	- 50.000	MACH	2.990	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
◁	0.000				
▷	20.000	REFERENCE FILE		NA 70 446	

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0039	SCALE

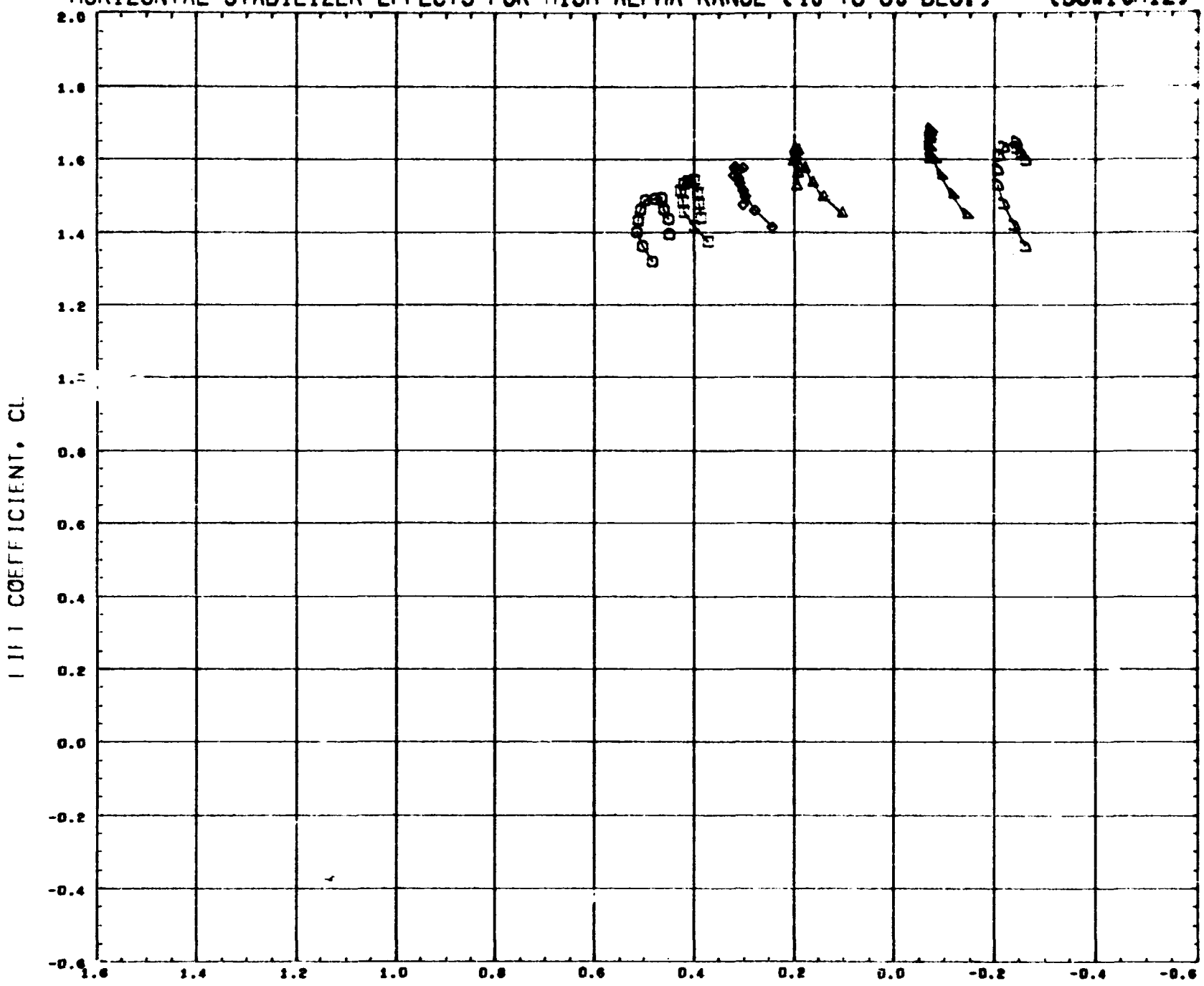
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W1OH12)



SYMBOL	HRZNTL	PARAMETRIC VALUES			
O	- 50.000	MACH	4.959	BETA	0.000
□	- 40.000				
◇	- 30.000				
Δ	- 20.000				
▽	0.000				
▷	20.000	REFERENCE FILE		NA 70 446	

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

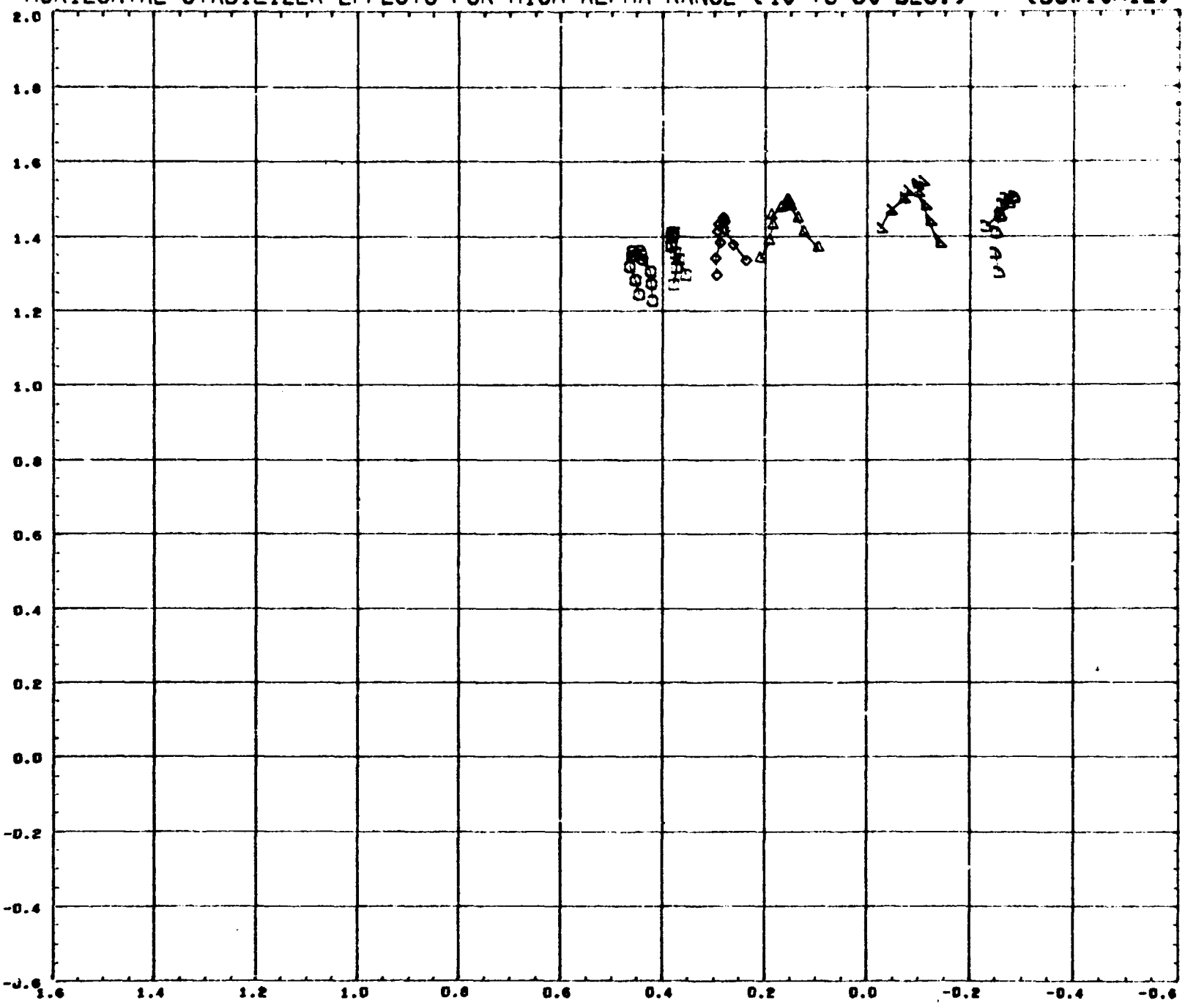
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
O	- 50.000	MACH	2.990	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▷	0.000				
▷	20.000	REFERENCE FILE		NA 70 446	

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

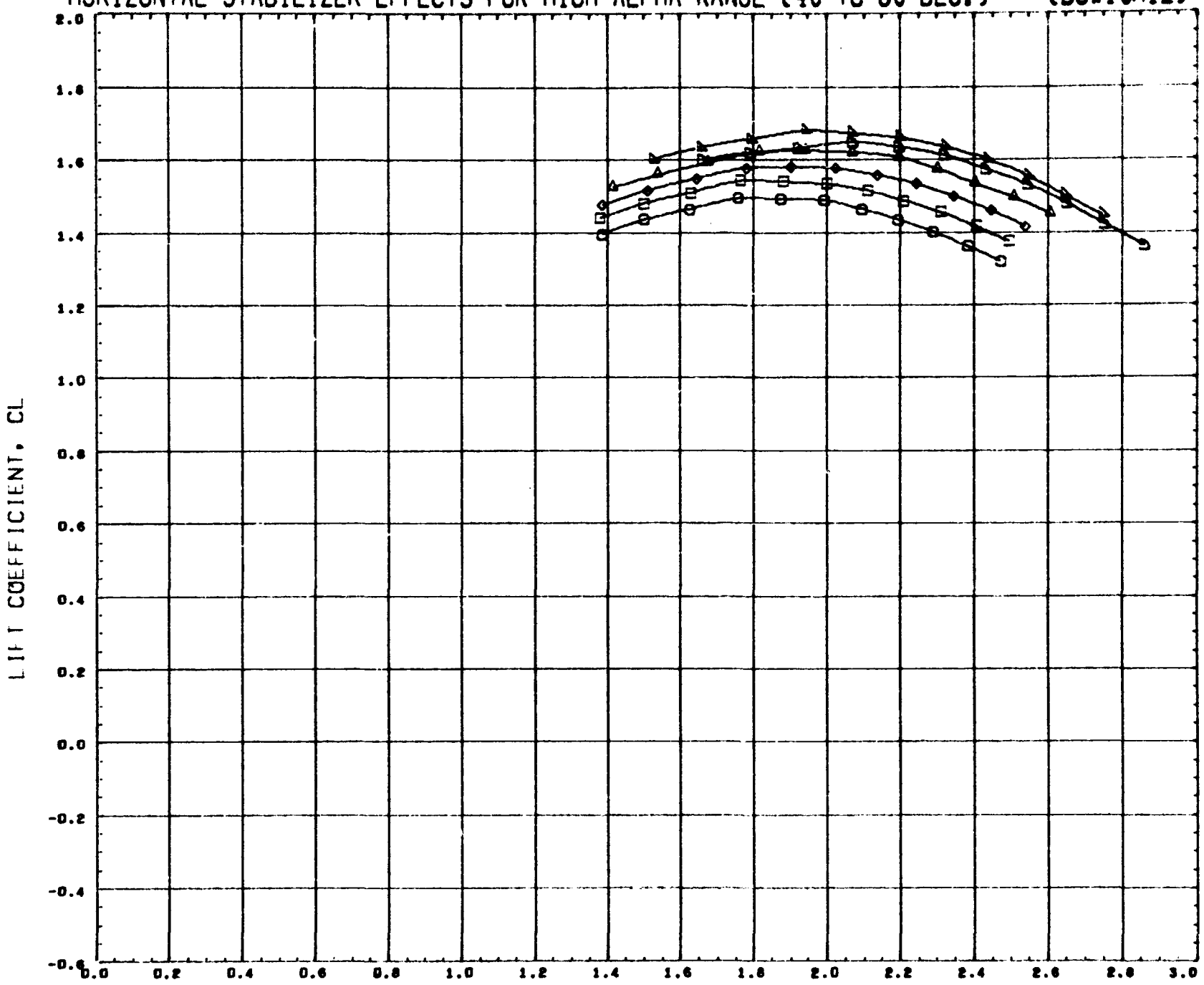
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 50.000	MACH	4.959	BETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▽	0.000				
▷	20.000	REFERENCE FILE	NA 70 446		

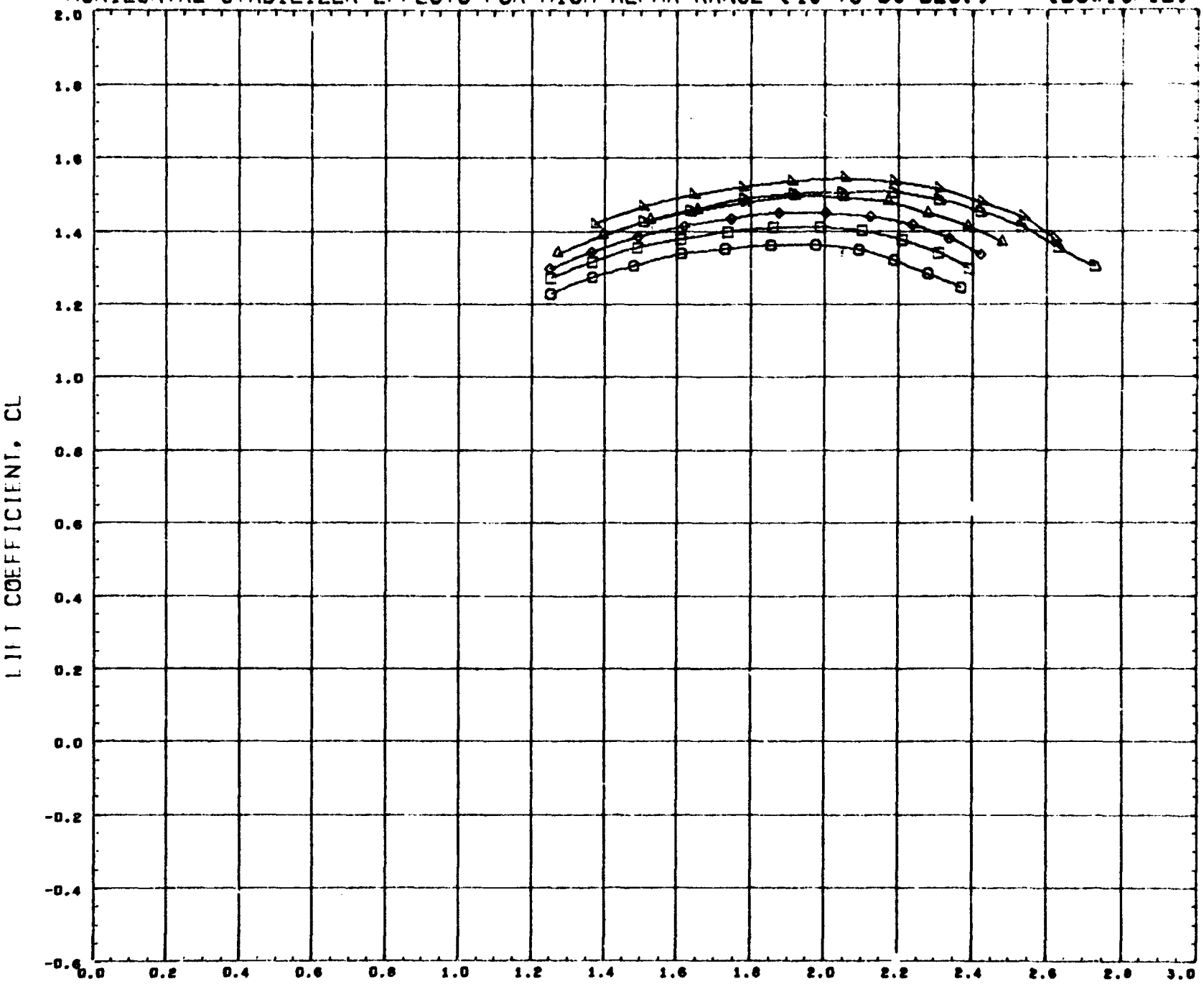
REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W10H12)



SYMBOL	HRZNTL	PARAMETRIC VALUES				REFERENCE INFORMATION		
○	- 50.000	MACH	2.990	BETA	0.000	REFS	5.4400	SQINCH
□	- 40.000					REFL	1.1300	INCHES
◇	- 30.000					REFB	5.2150	INCHES
△	- 20.000					XMRP	4.5260	INCHES
▷	0.000					YMRP	0.0000	INCHES
□	20.000	REFERENCE FILE		NA 70 446		ZMRP -	0.1760	INCHES
						SCALE	0.0035	SCALE

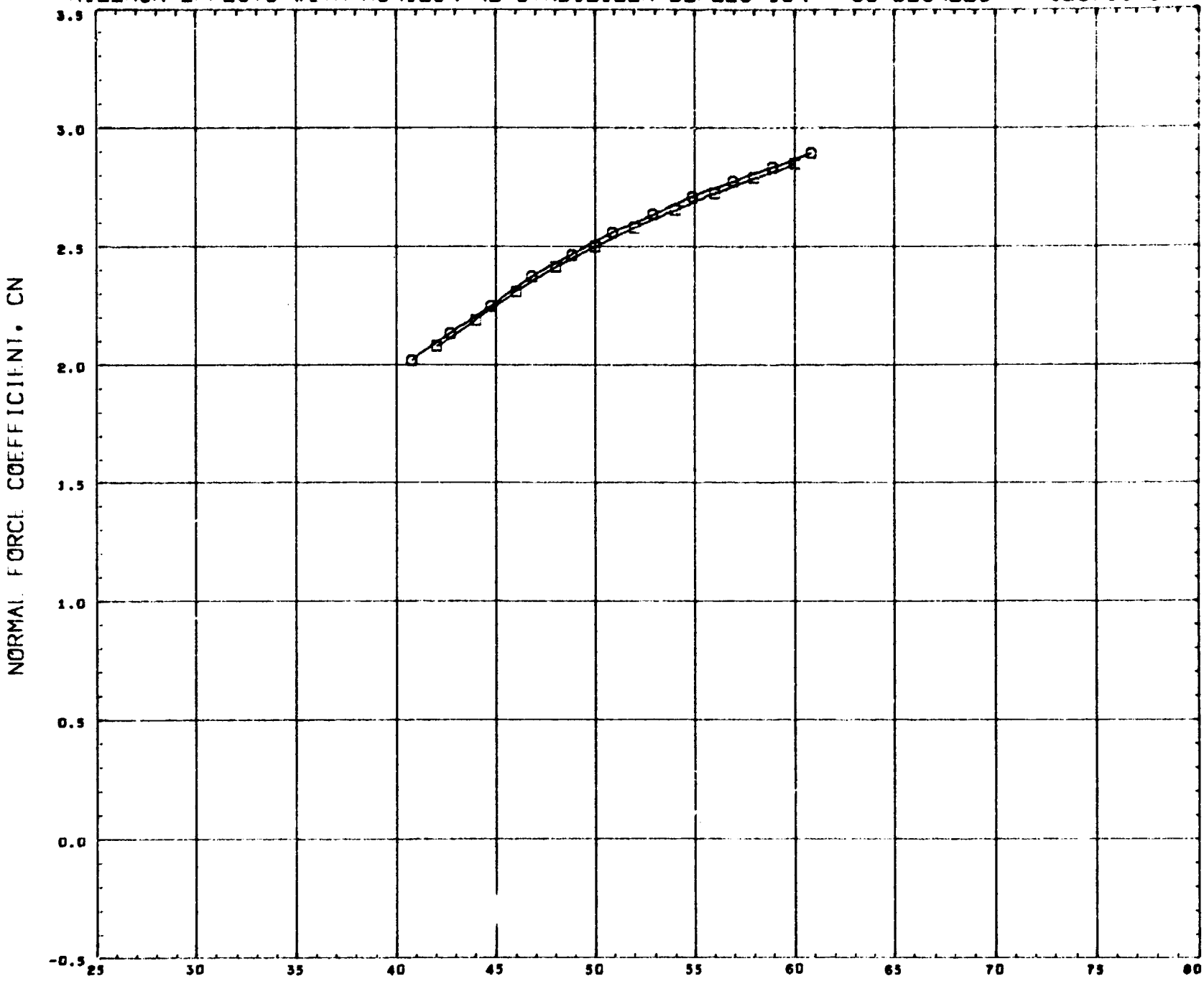
HORIZONTAL STABILIZER EFFECTS FOR HIGH ALPHA RANGE (40 TO 60 DEG.) (B6W1OH12)



SYMBOL	HRZNTL		PARAMETRIC VALUES		
○	- 50.000	MACH	4.959	DETA	0.000
□	- 40.000				
◇	- 30.000				
△	- 20.000				
▽	0.000				
▷	20.000	REFERENCE FILE		NA 70 446	

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)

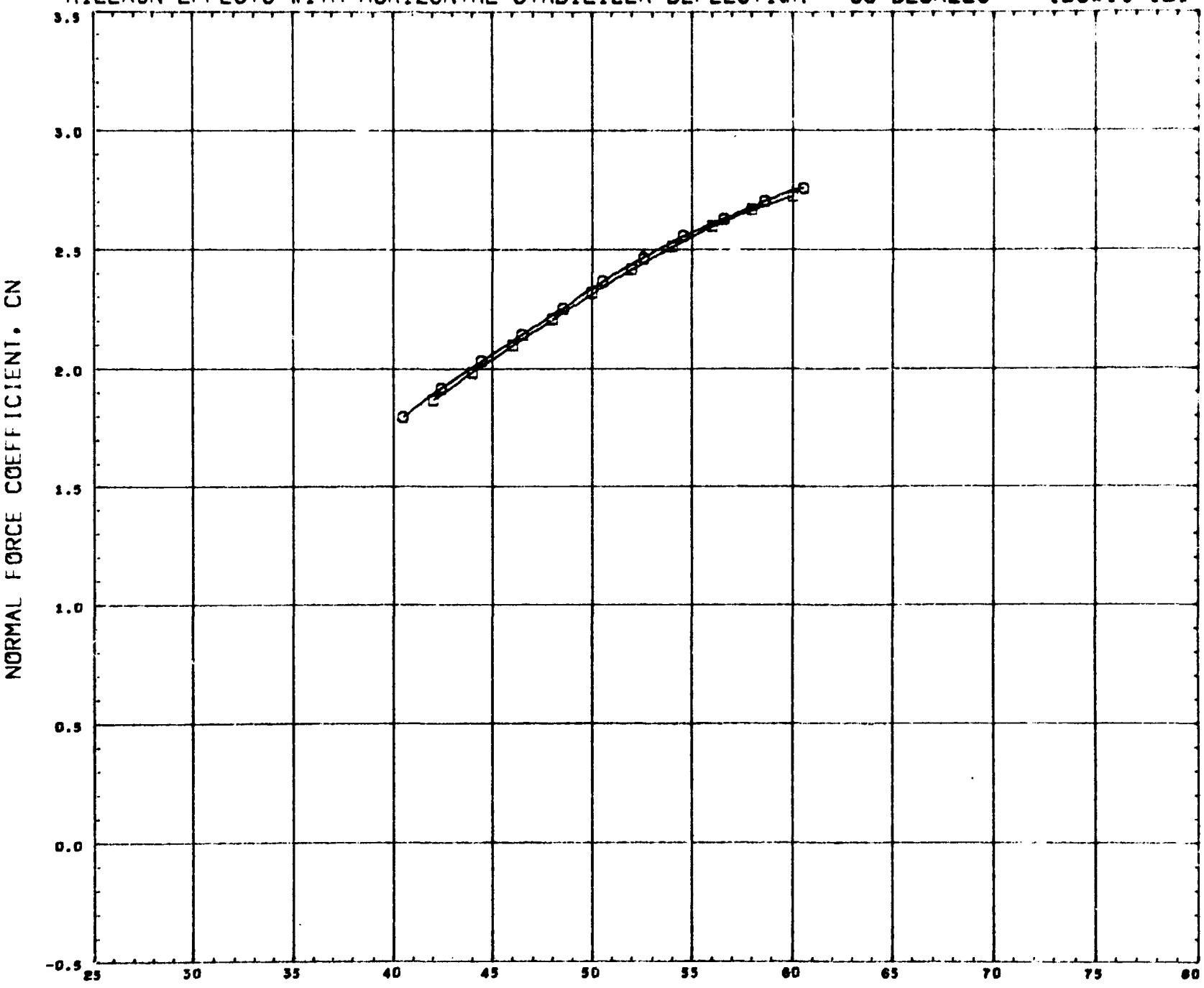


SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	2.990	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)



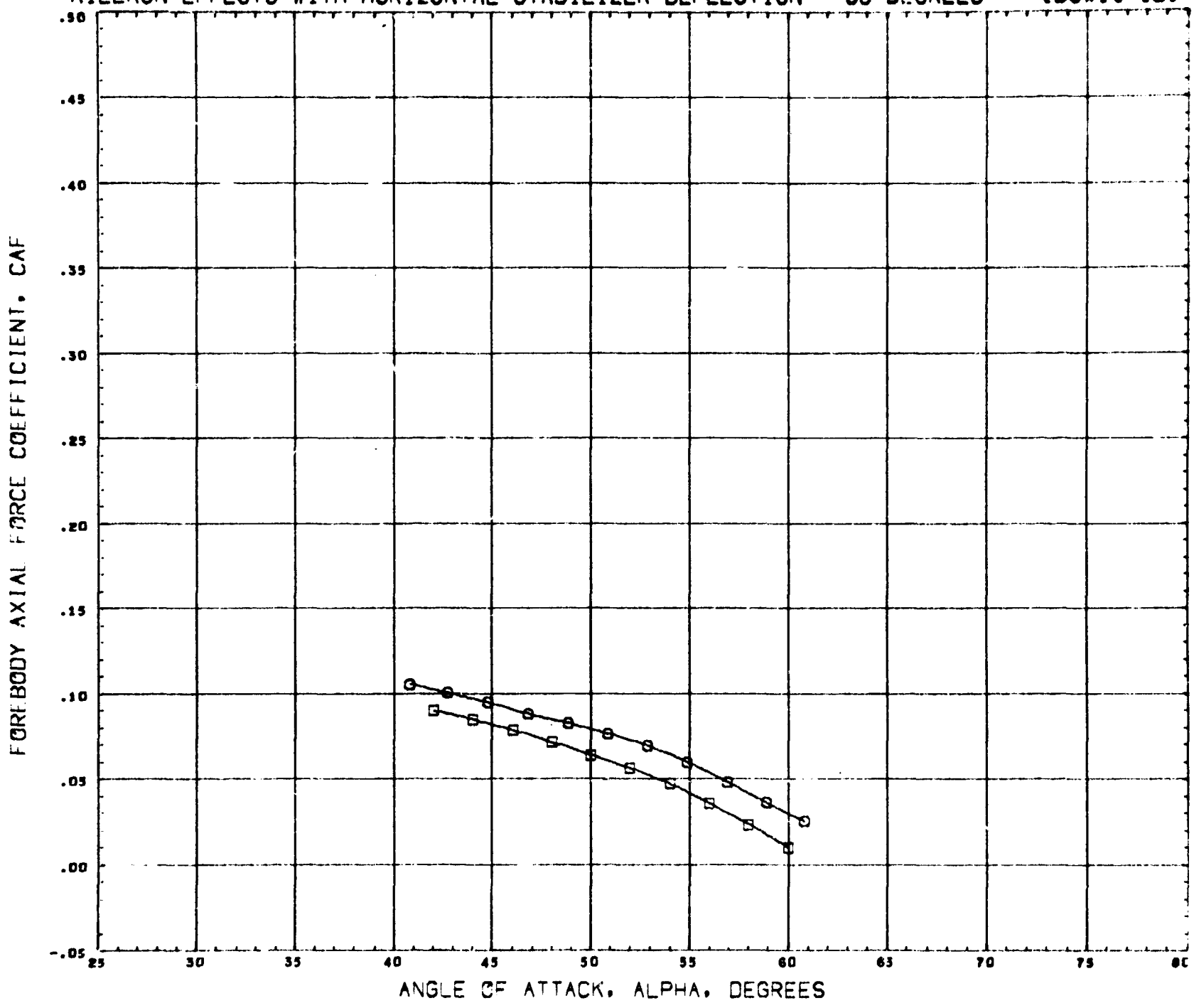
SYMBOL	AILRON	PARAMETRIC VALUES			
□	- 15.000	MACH	4.959	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA LIST. CODE H

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)



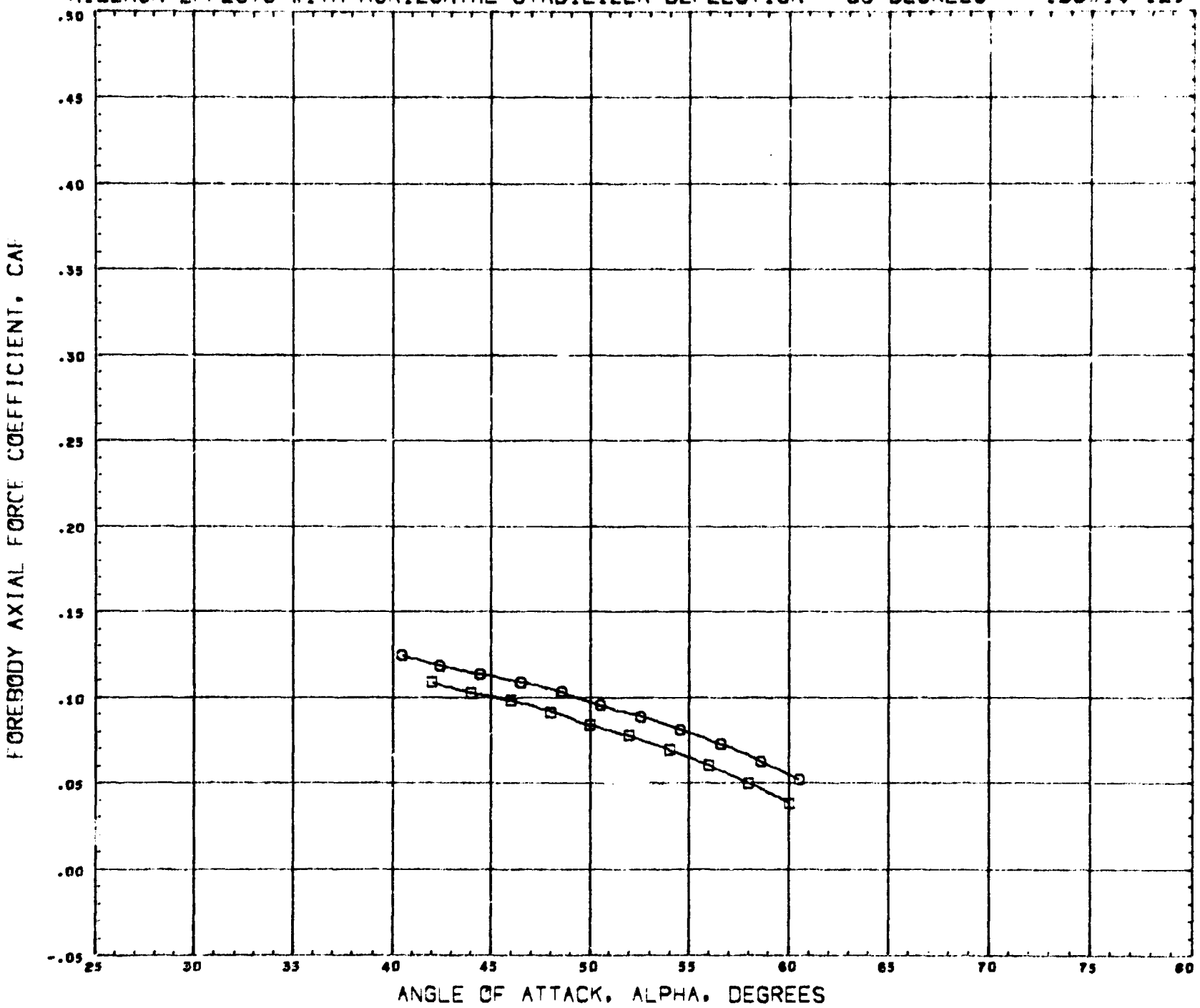
SYMBOL	AILRON		PARAMETRIC VALUES		
○	- 15.000	MACH	2.990	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)

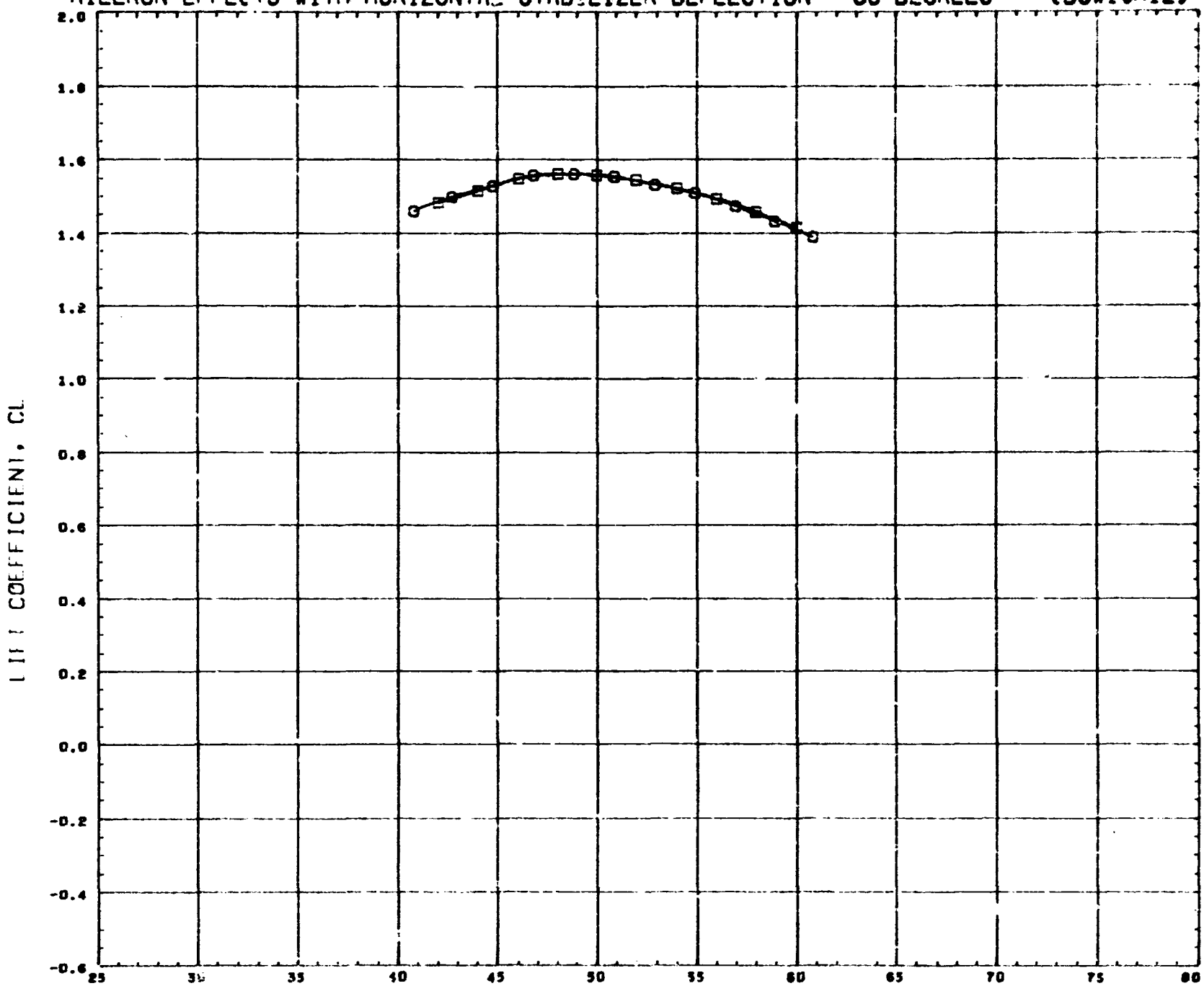


SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	4.959	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE H

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)



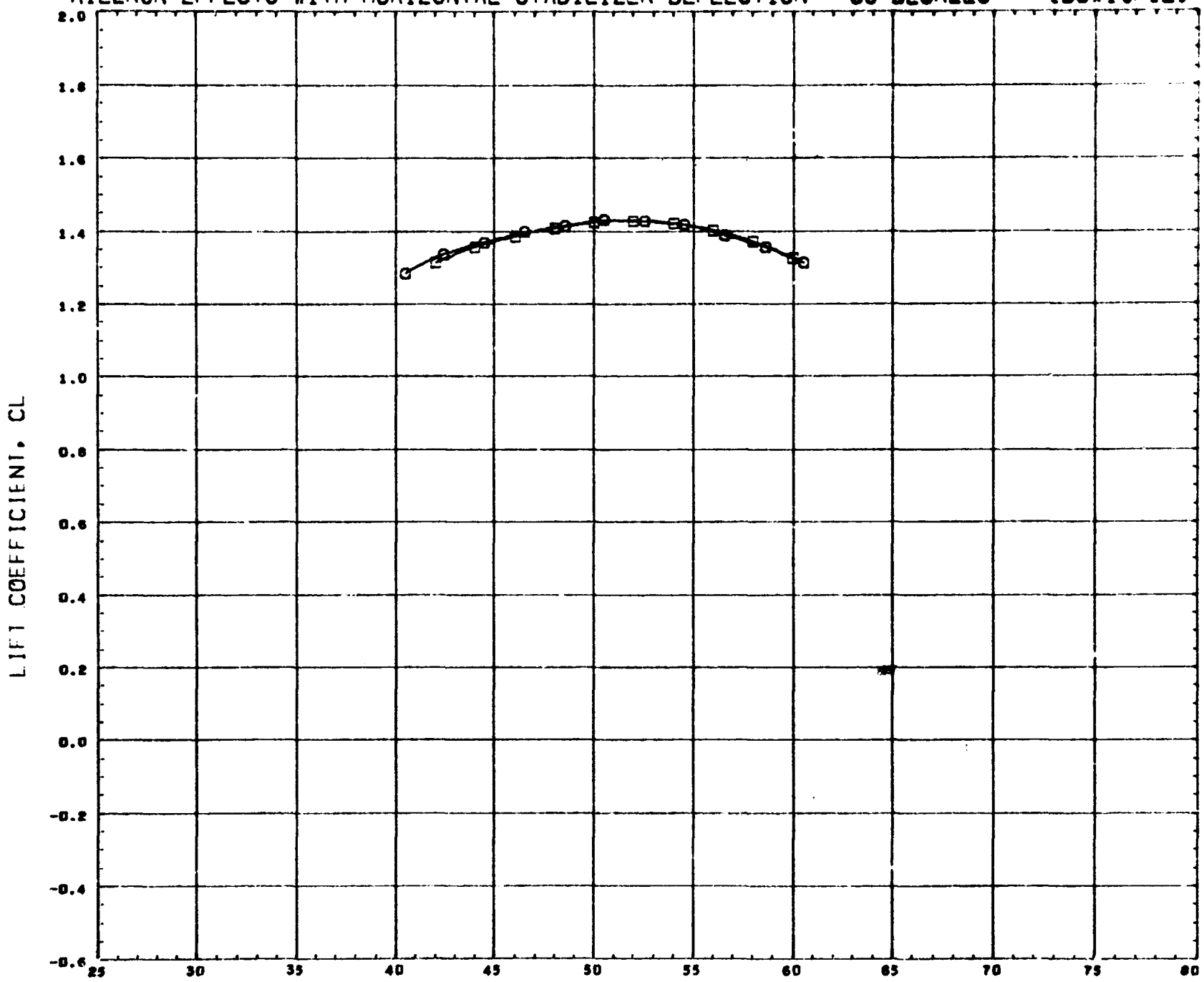
SYMBOL	AILRON		PARAMETRIC VALUES		
O	- 15.000	MACH	2.950	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)



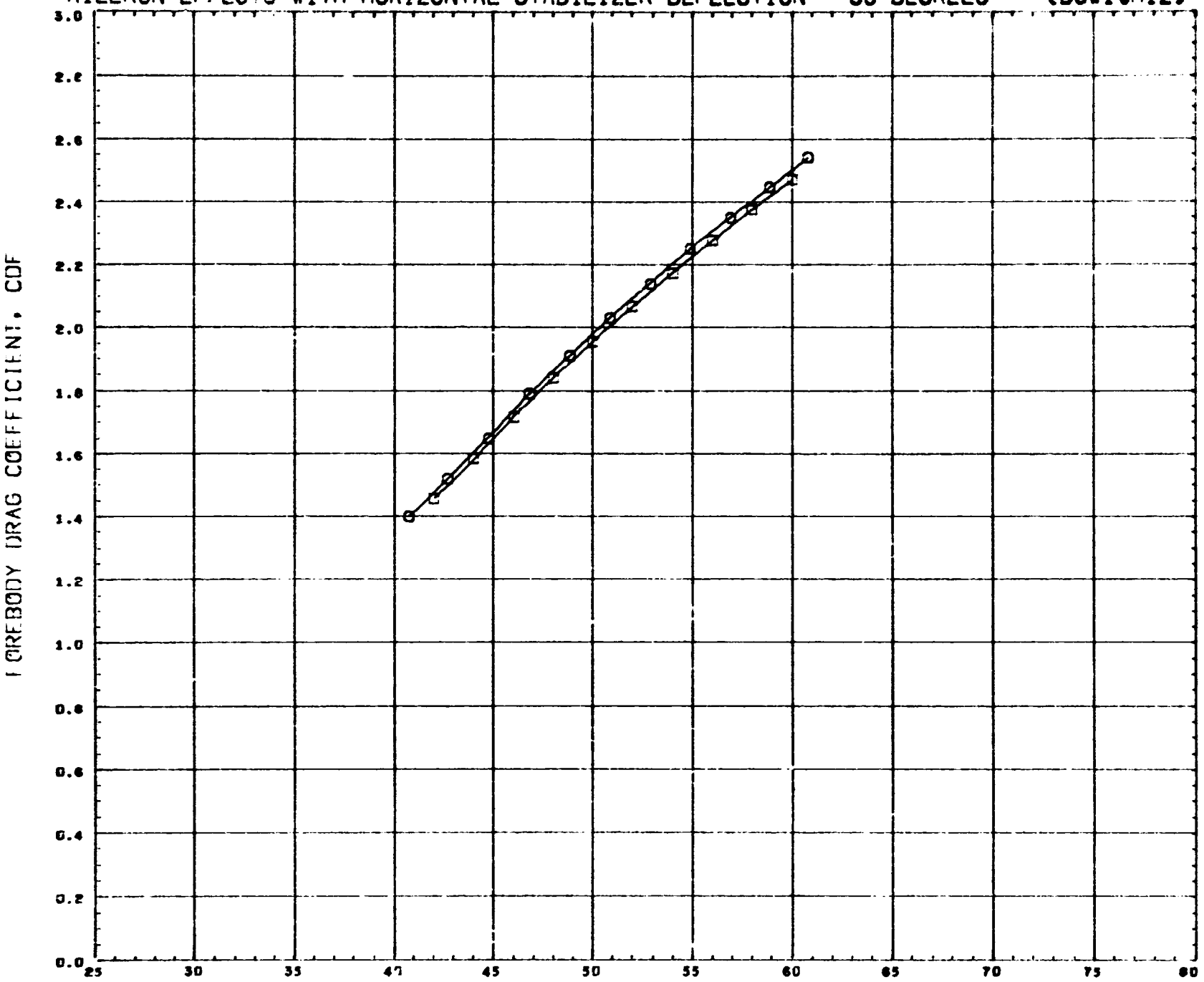
SYMBOL	AILRON		PARAMETRIC VALUES		
□	- 15.000	MACH	4.959	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE H

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)



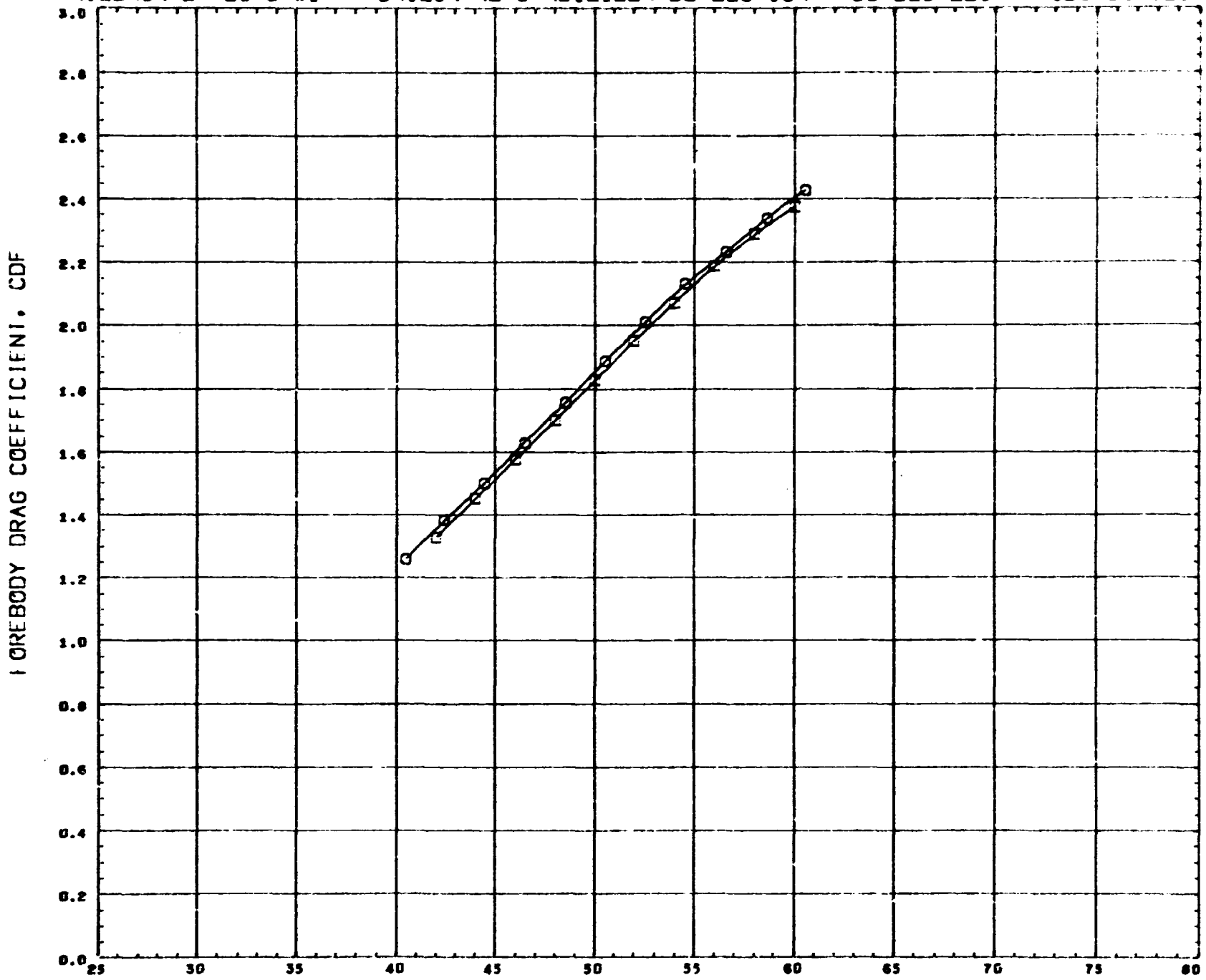
SYMBOL	AILRON		PARAMETRIC VALUES		
O	- 15.000	MACH	2.990	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)

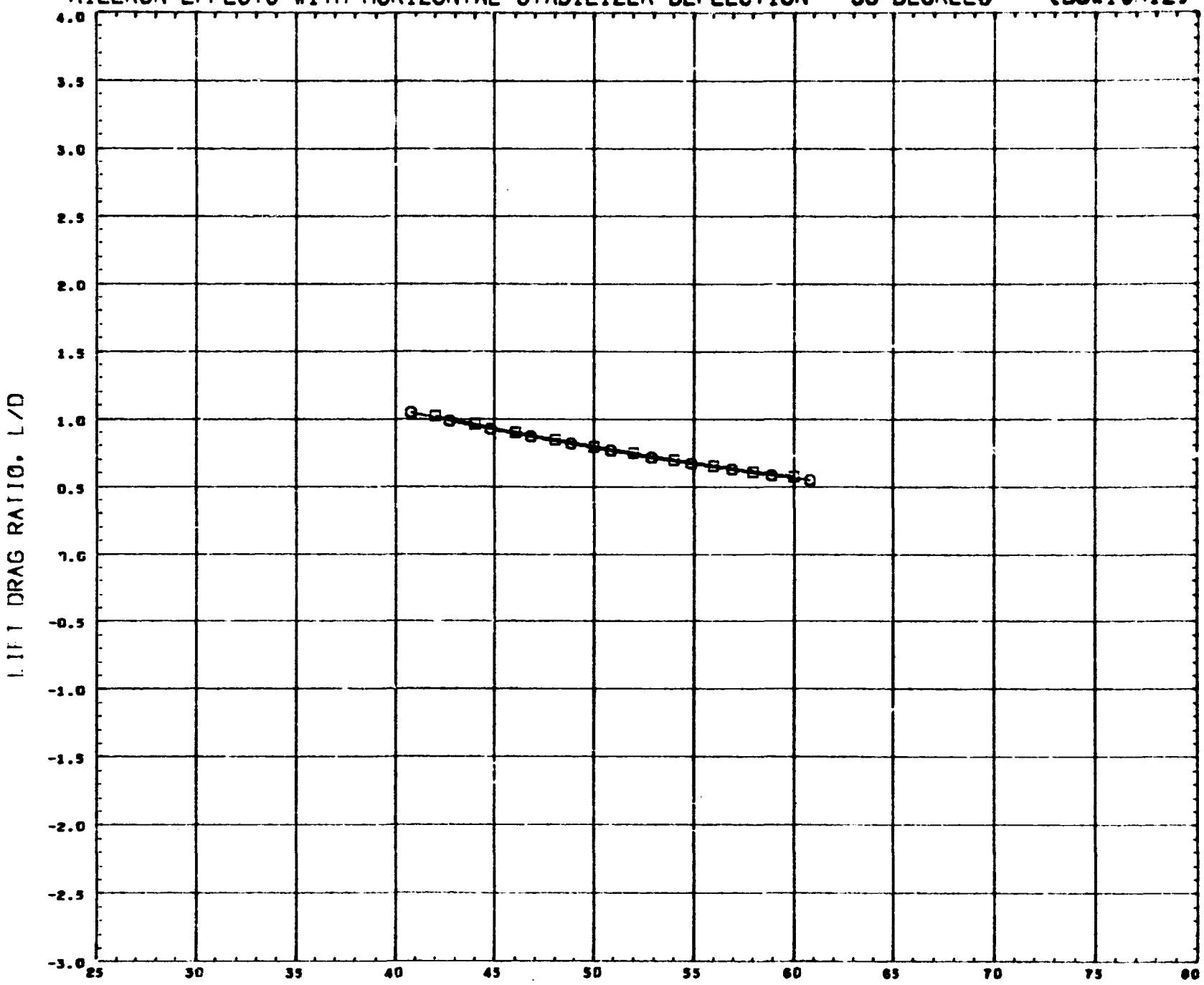


SYMBOL	AILRON	PARAMETRIC VALUES			
○	- 15.000	MACH	4.955	BETA	0.000
□	0.000	MRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W1CH12)



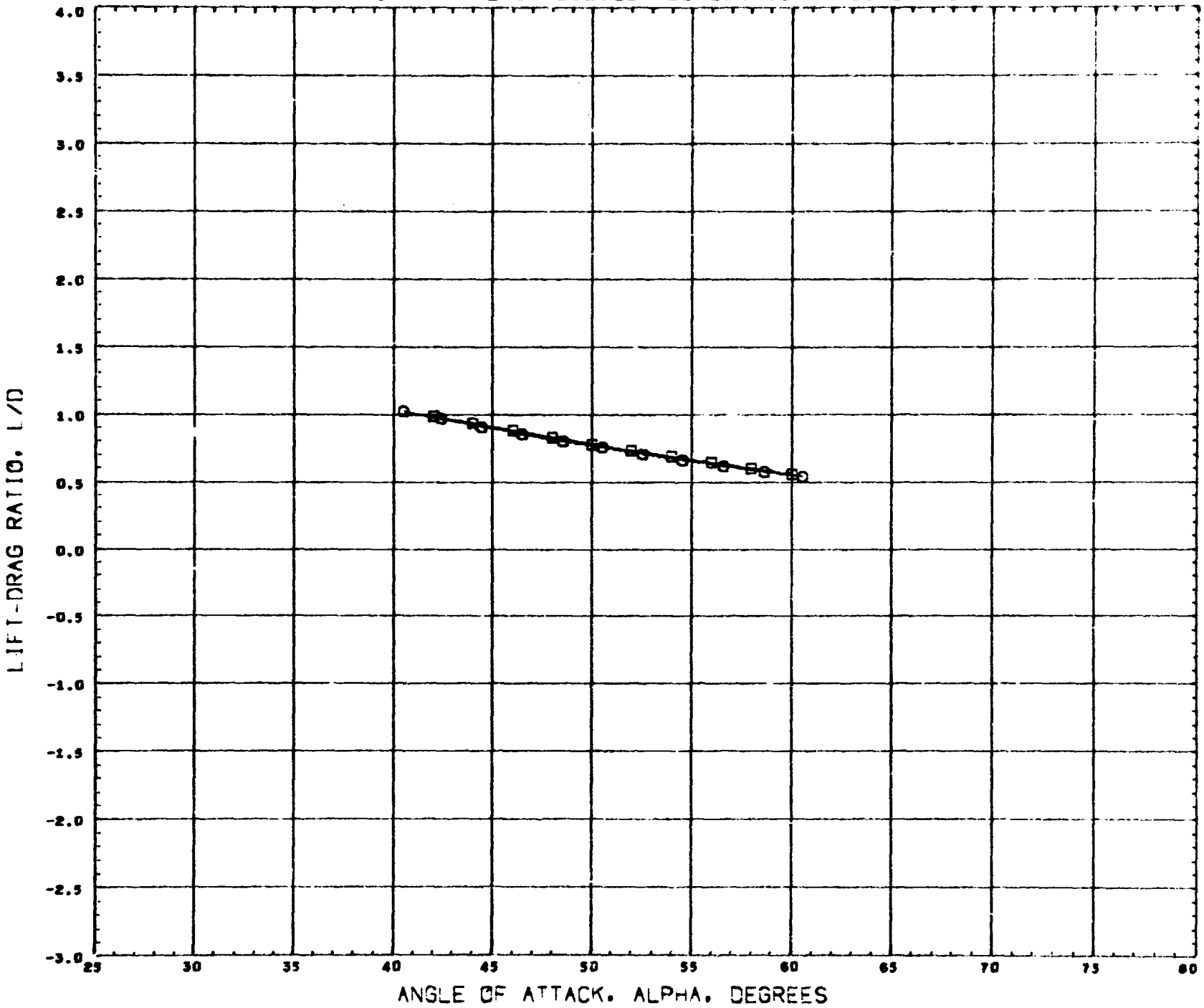
SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	2.590	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE H

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0033	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)



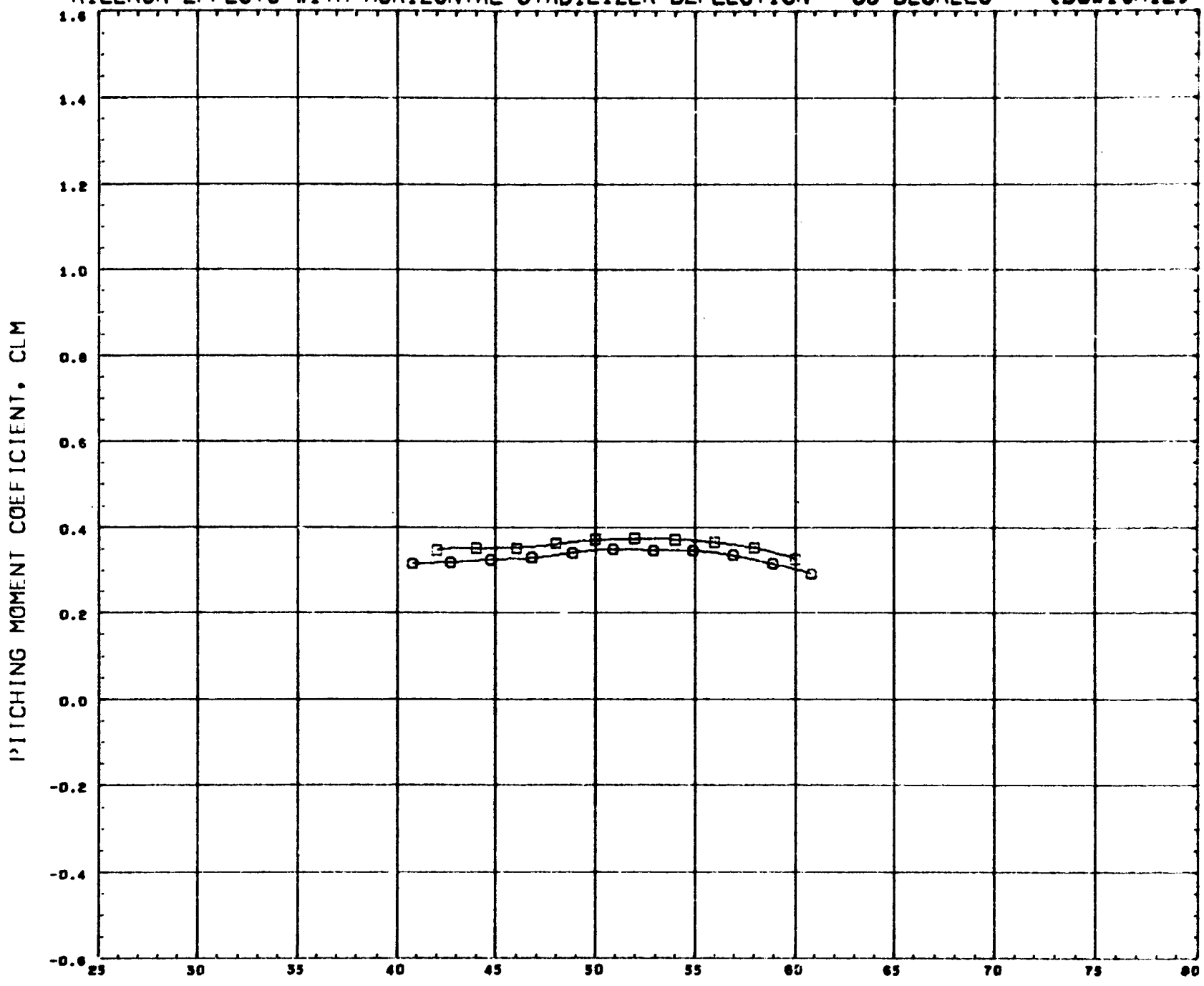
SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	4.959	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE H

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)

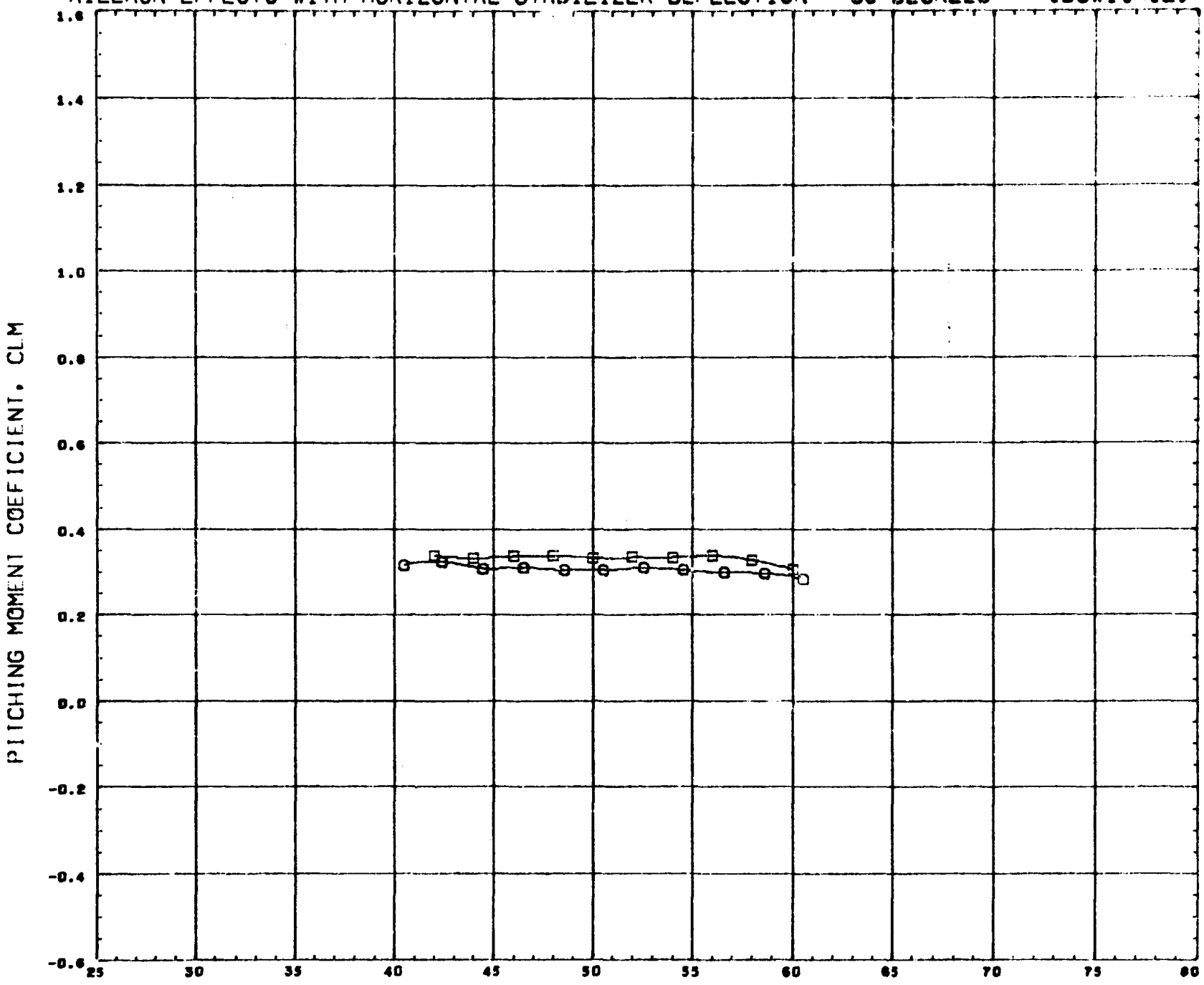


SYMBOL	AILRON		PARAMETRIC VALUES		
O	- 15.000	MACH	2.990	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)



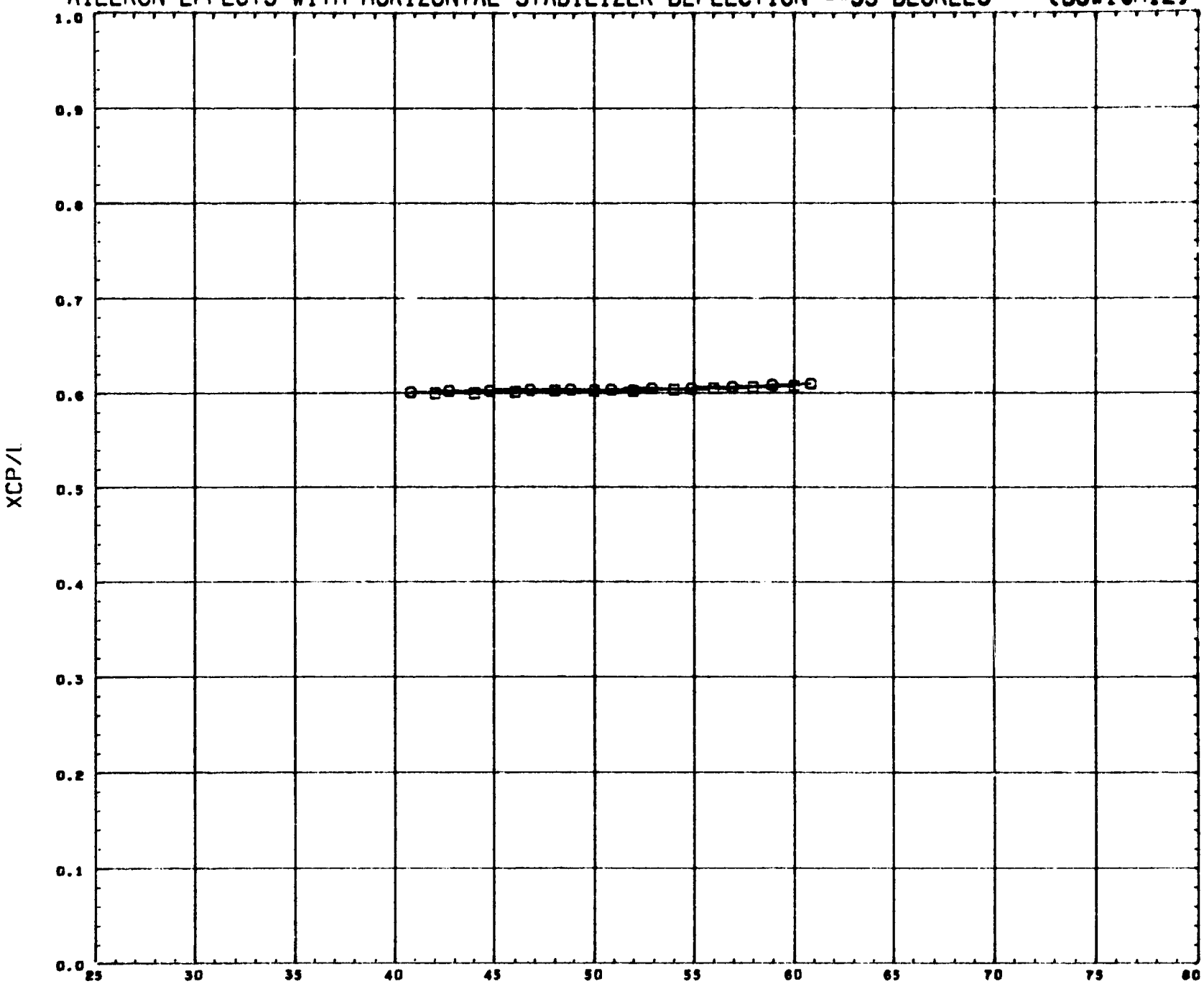
SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	4.959	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE H

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)

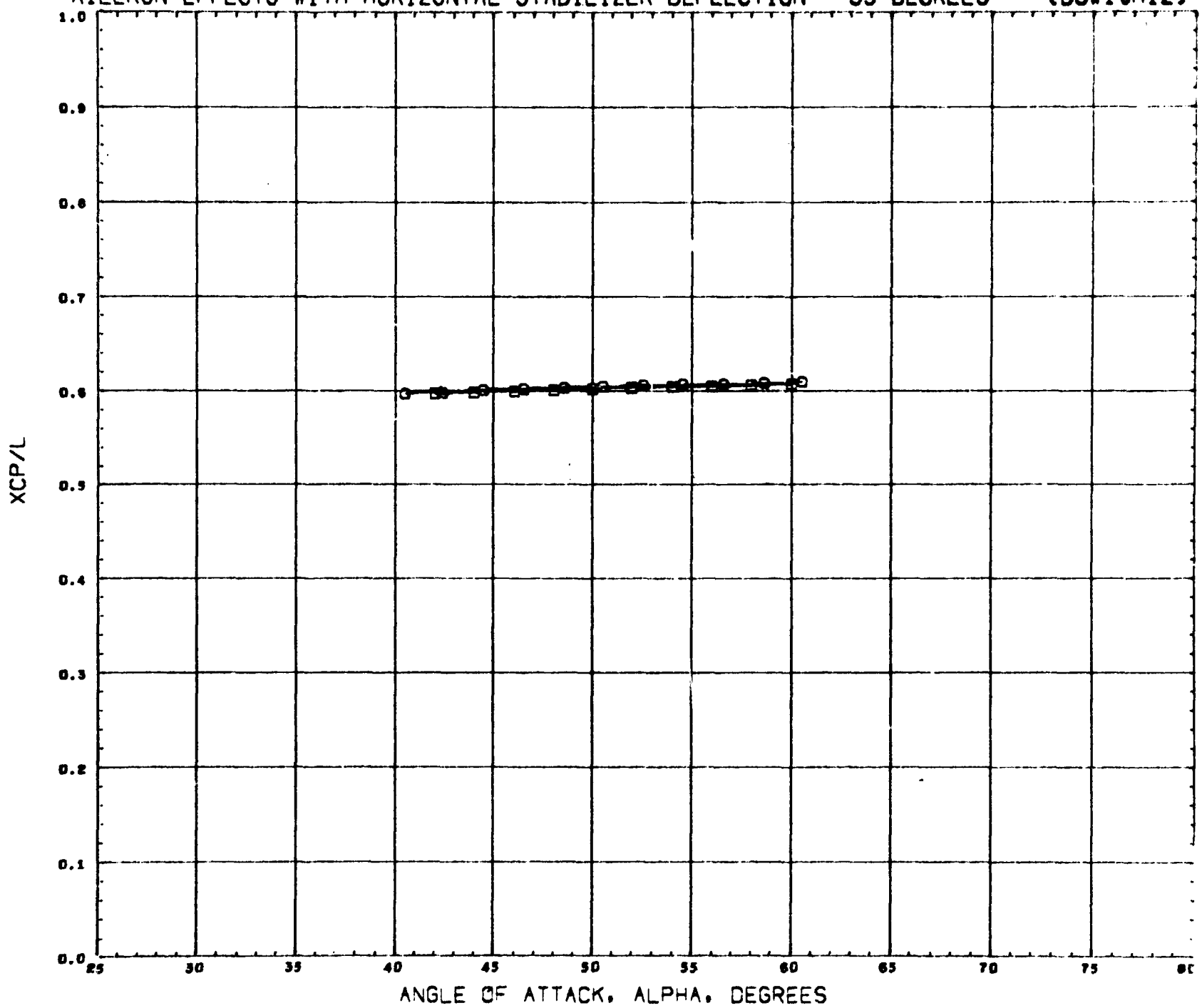


SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	2.990	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)

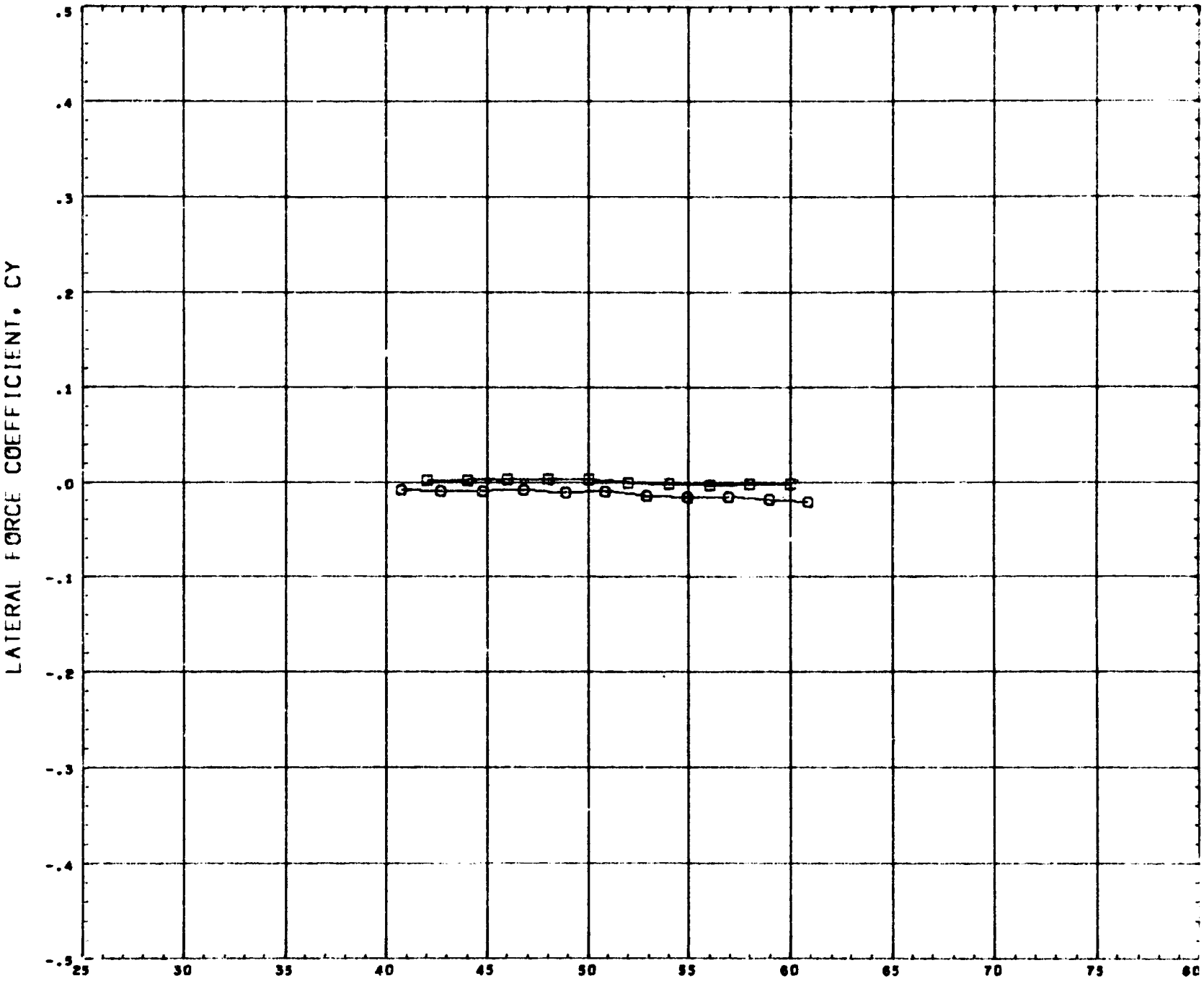


SYMBOL	AILRON	PARAMETRIC VALUES			
□	- 15.000	MACH	4.959	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE H

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.3260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)

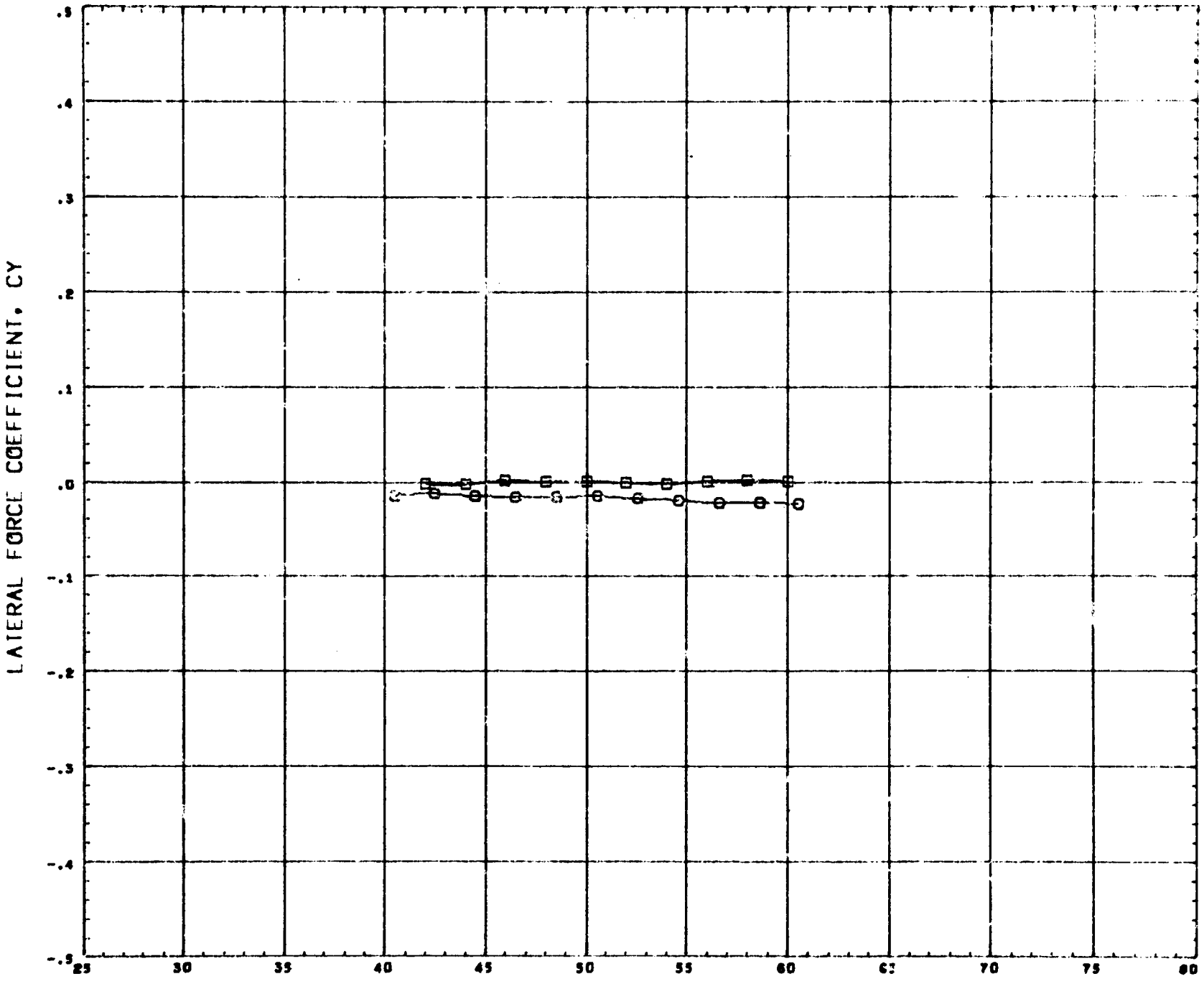


SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	2.990	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)



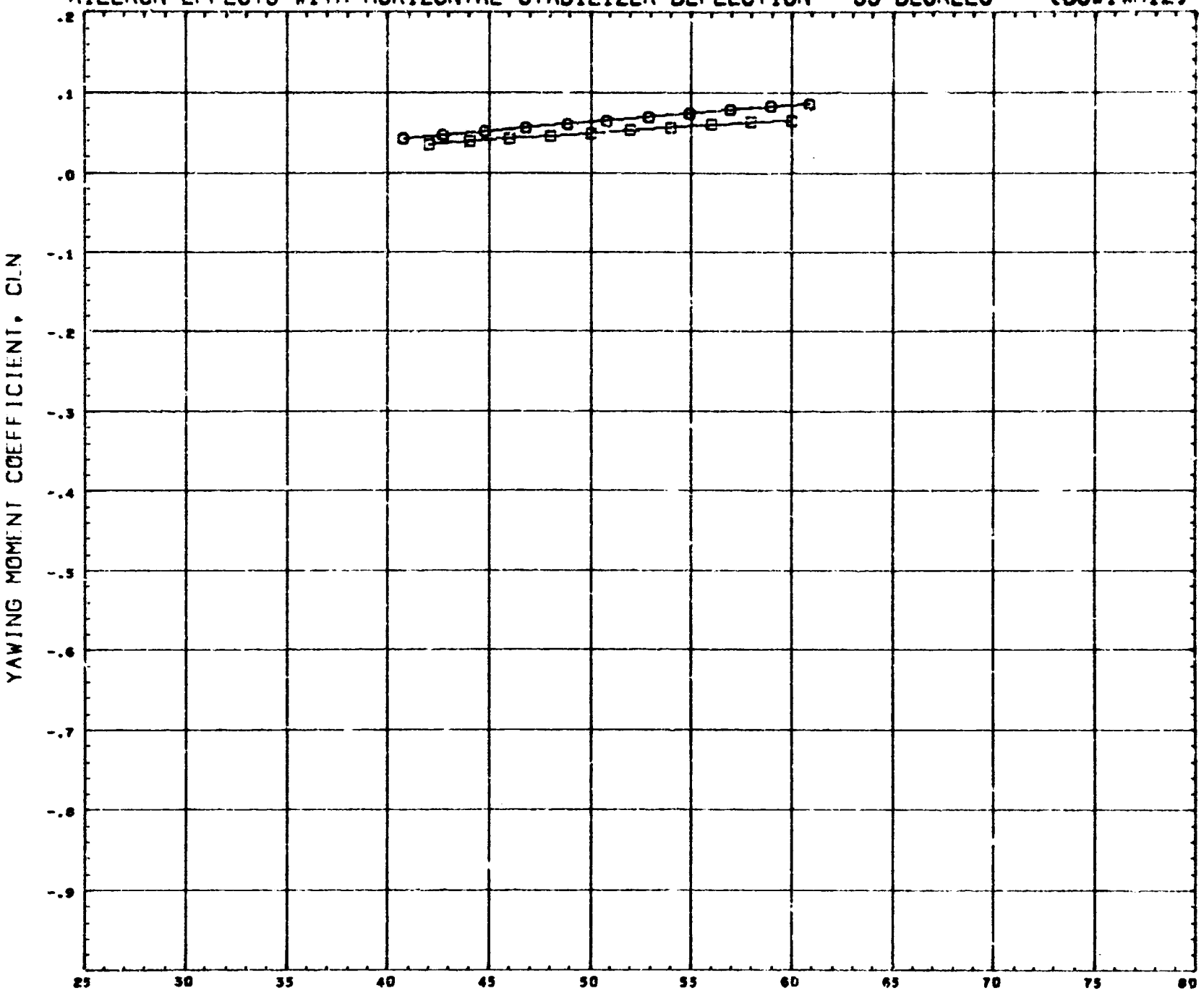
SYMBOL	AILRON	PARAMETRIC VALUES			
○	- 35.000	MACH	4.959	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE H

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1760	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)

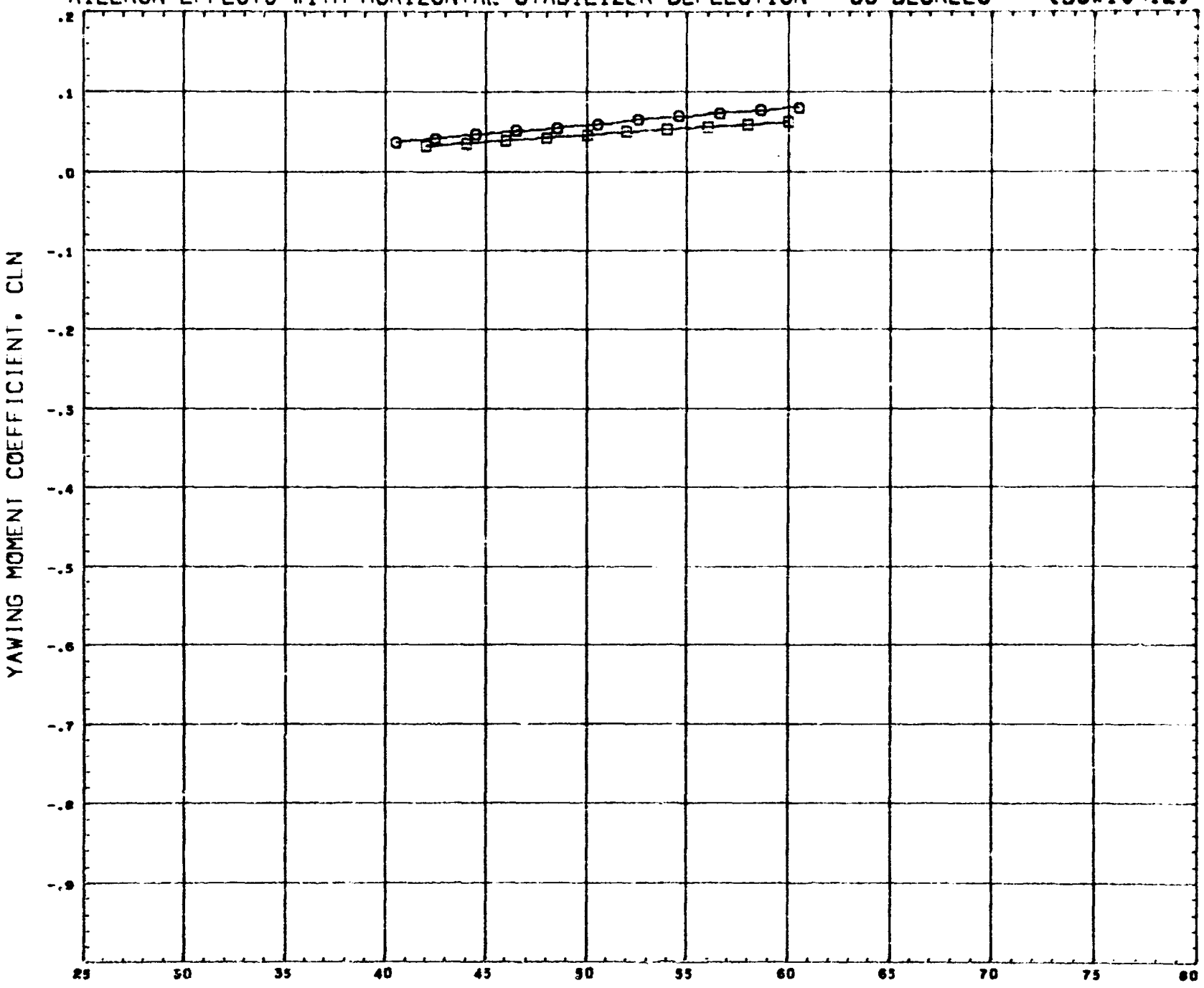


SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	2.990	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE H

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5266	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1700	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)



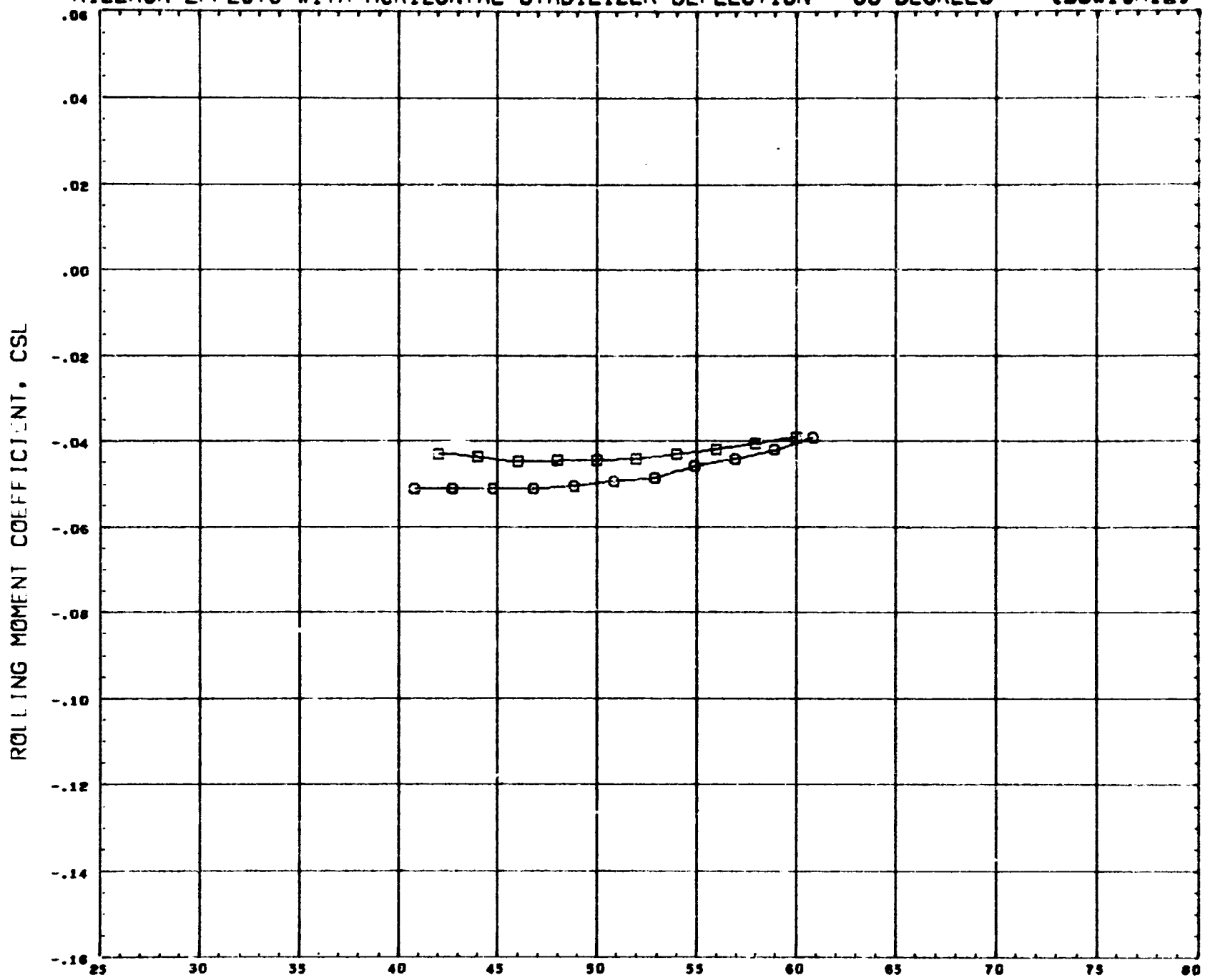
SYMBOL	AILRON	PARAMETRIC VALUES			
○	- 15.000	MACH	4.959	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE H

REFERENCE INFORMATION

REFS	5 4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)

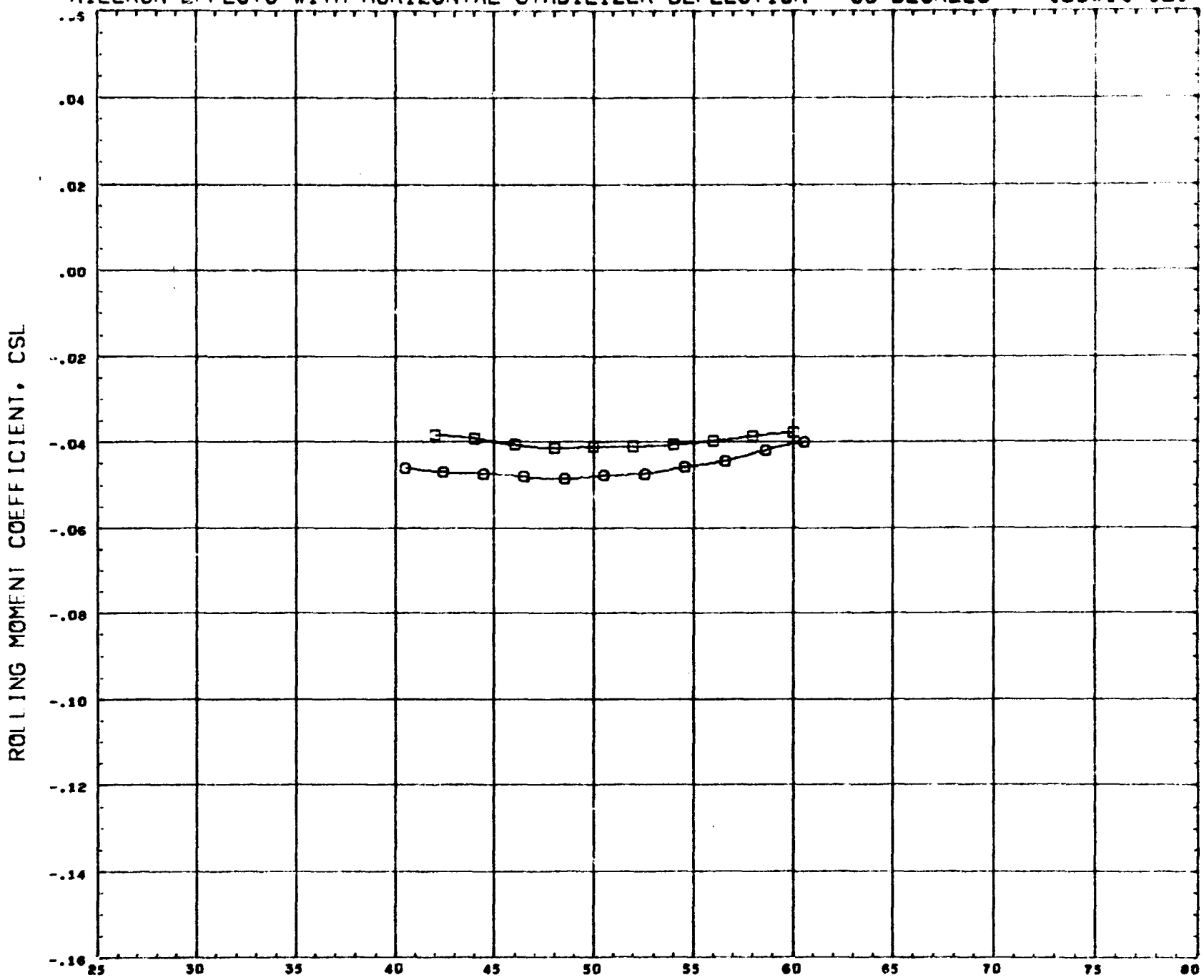


SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	2.990	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)

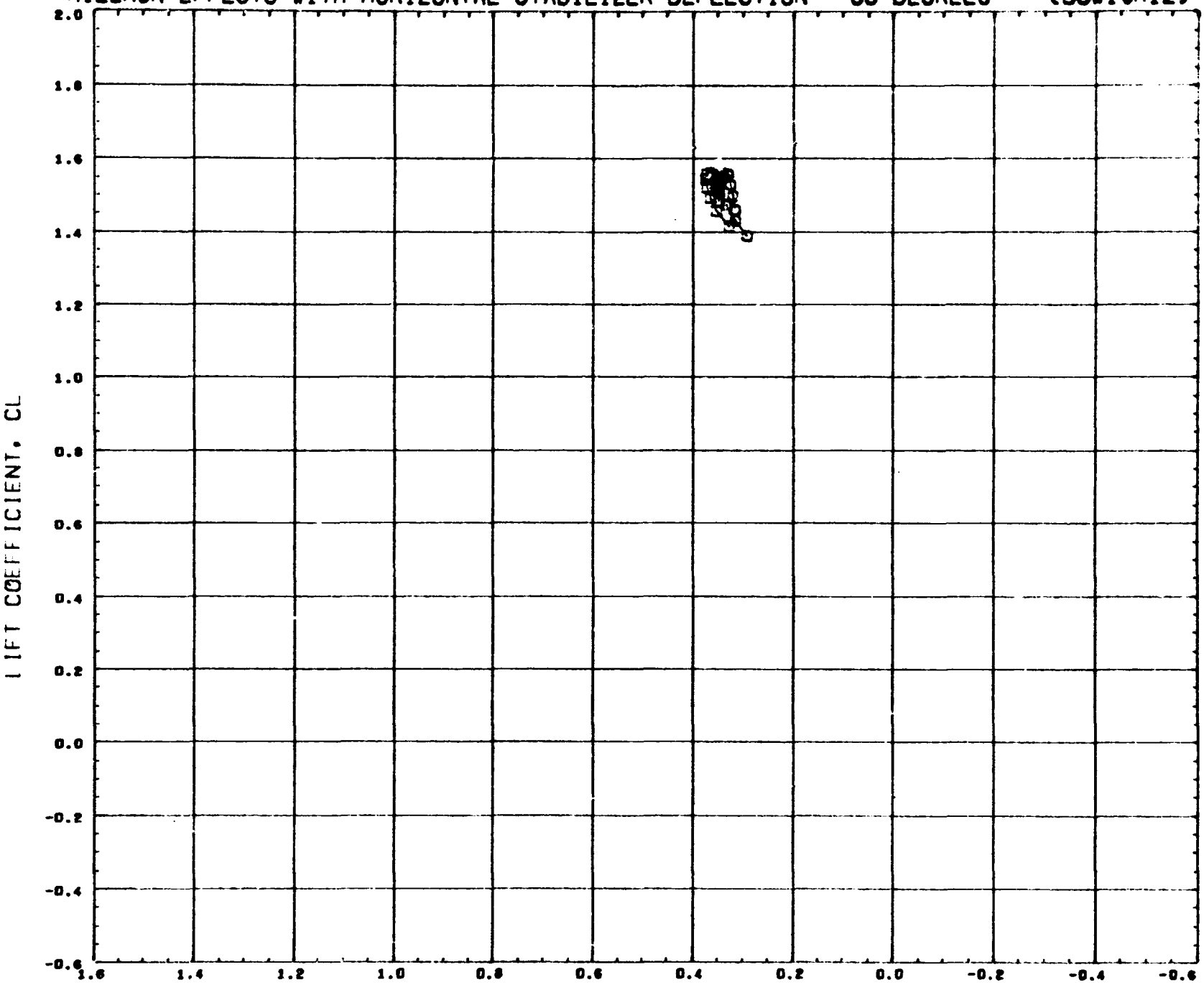


SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	4.959	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE H

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2130	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)



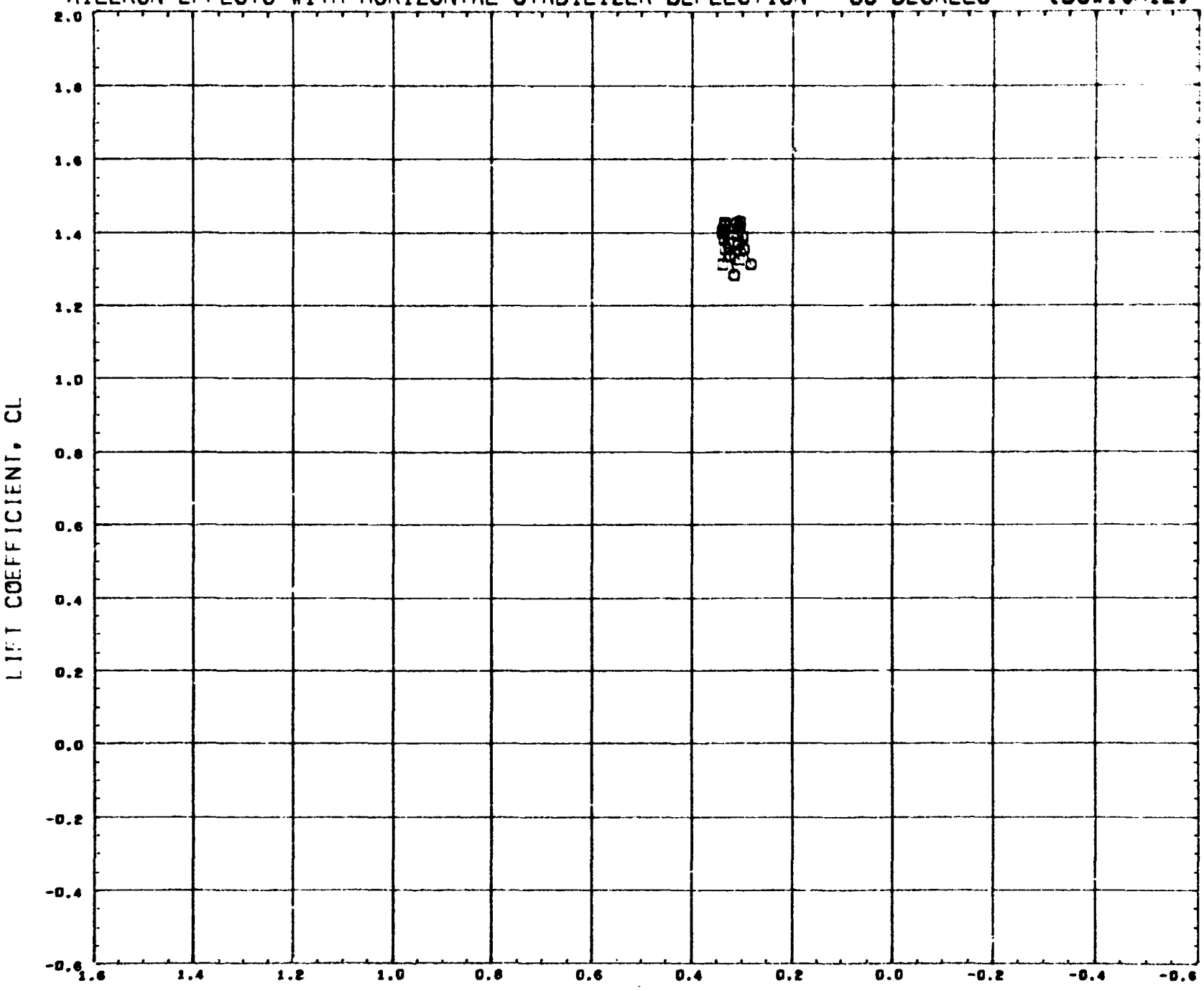
SYMBOL	AILRON		PARAMETRIC VALUES		
O	- 15.000	MACH	2.990	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)



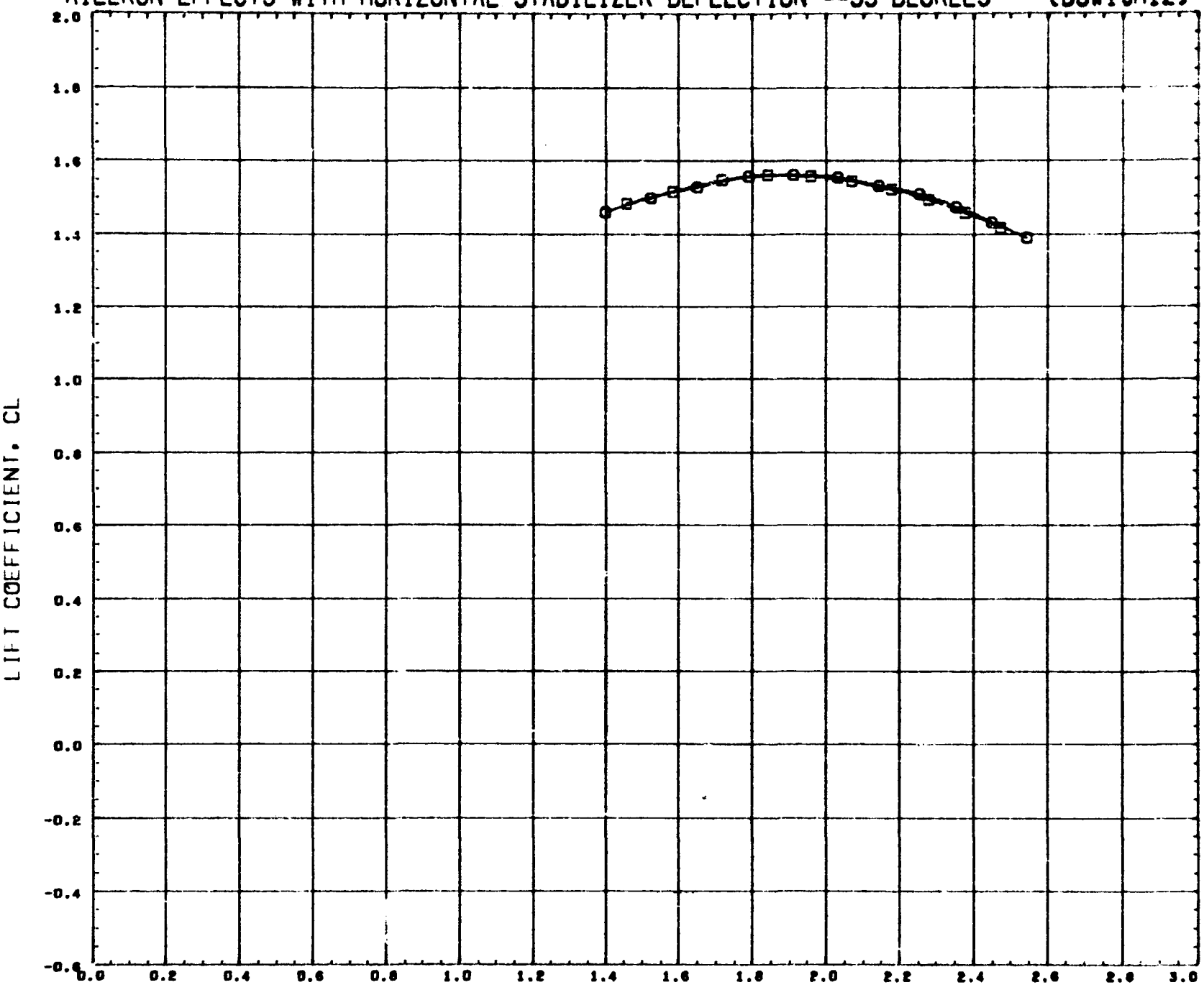
SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	4.959	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)



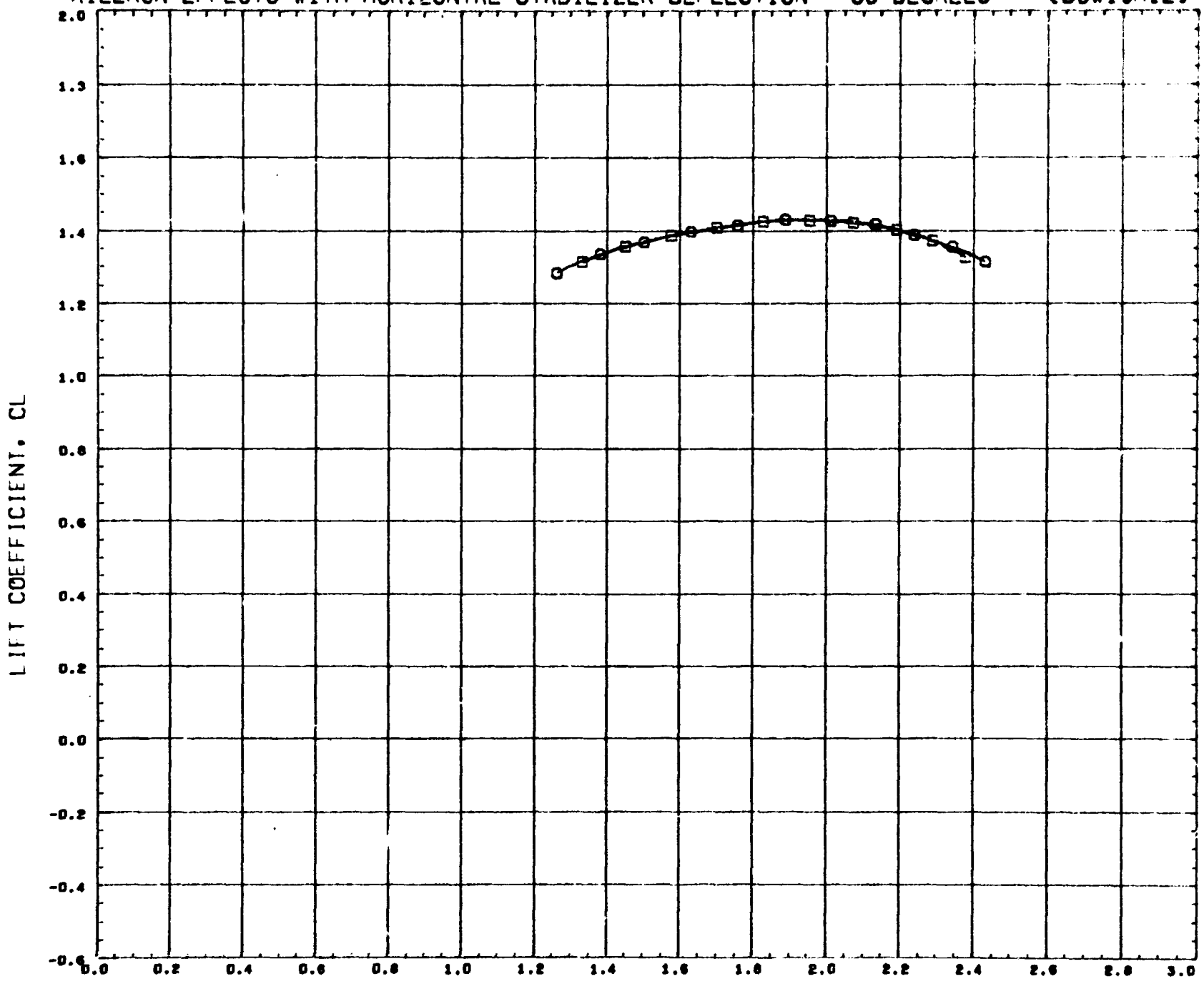
SYMBOL	AILRON	PARAMETRIC VALUES			
□	- 15.000	MACH	2.990	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

AILERON EFFECTS WITH HORIZONTAL STABILIZER DEFLECTION =-35 DEGREES (B6W10H12)

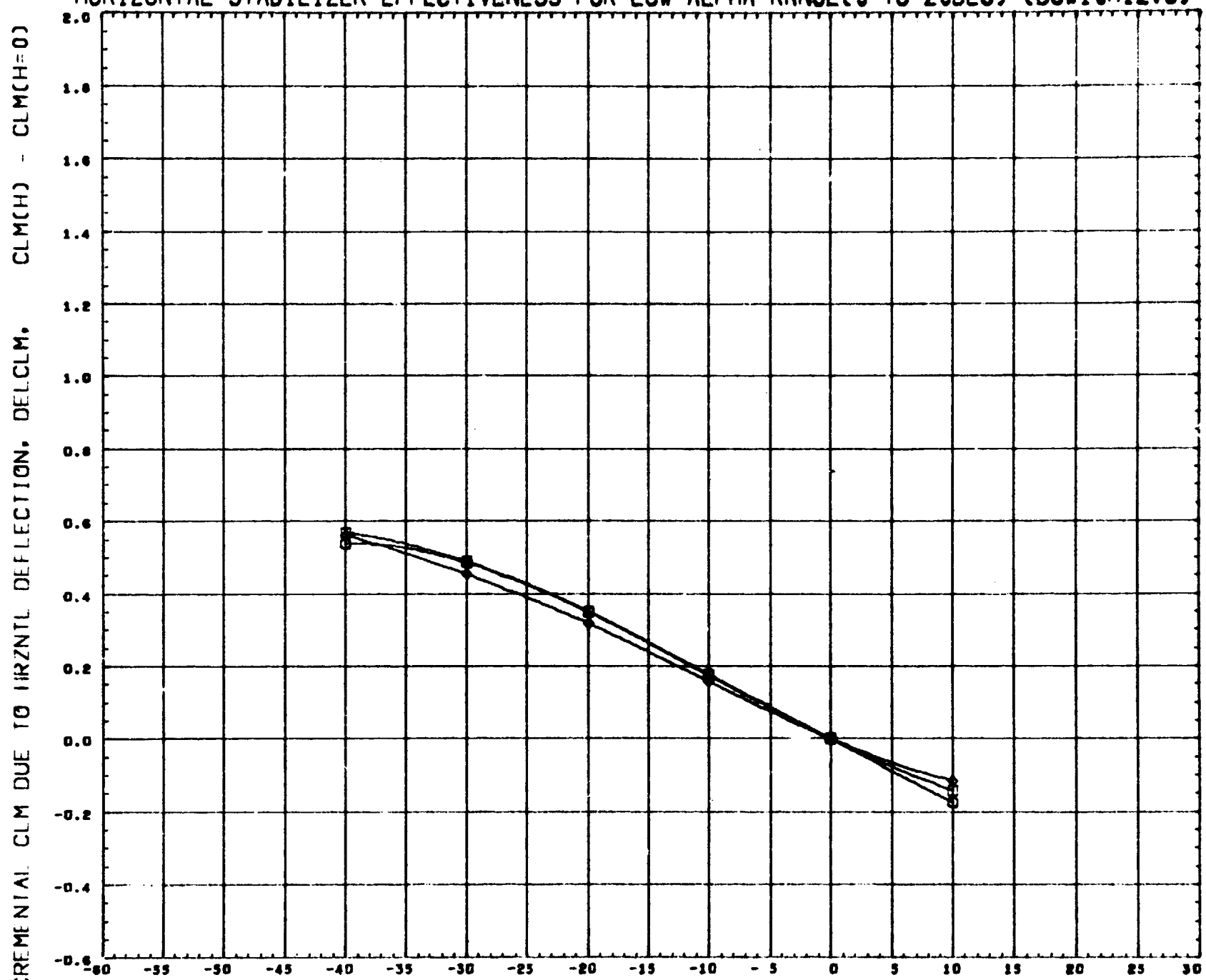


SYMBOL	AILRON	PARAMETRIC VALUES			
○	- 15.000	MACH	4.959	BETA	0.000
□	0.000	HRZNTL	- 35.000		

DATA HIST. CODE M

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

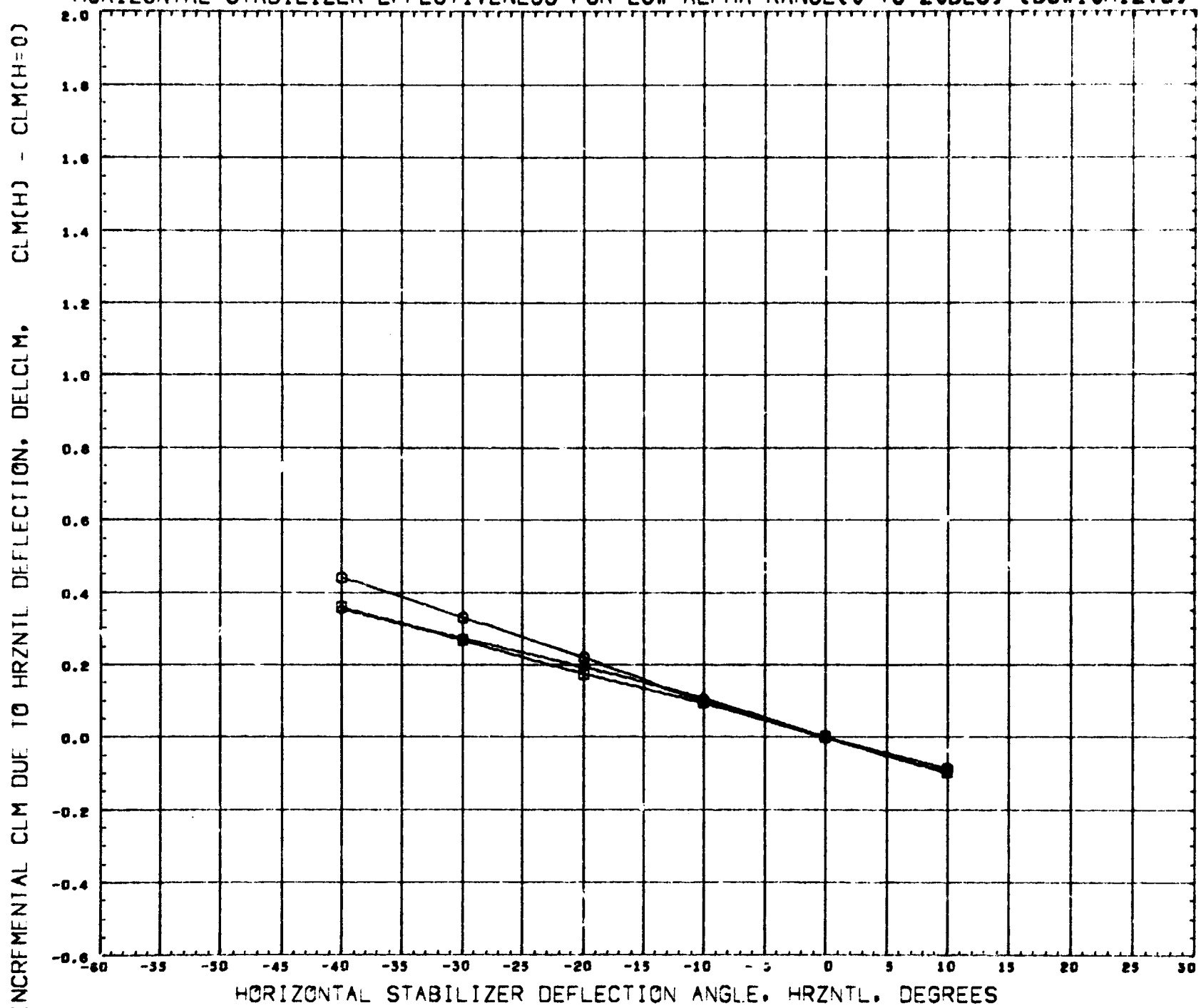


SYMBOL	ALPHA		PARAMETRIC VALUES		
○	0.000	MACH	2.000	BETA	0.000
□	10.000				
◇	20.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

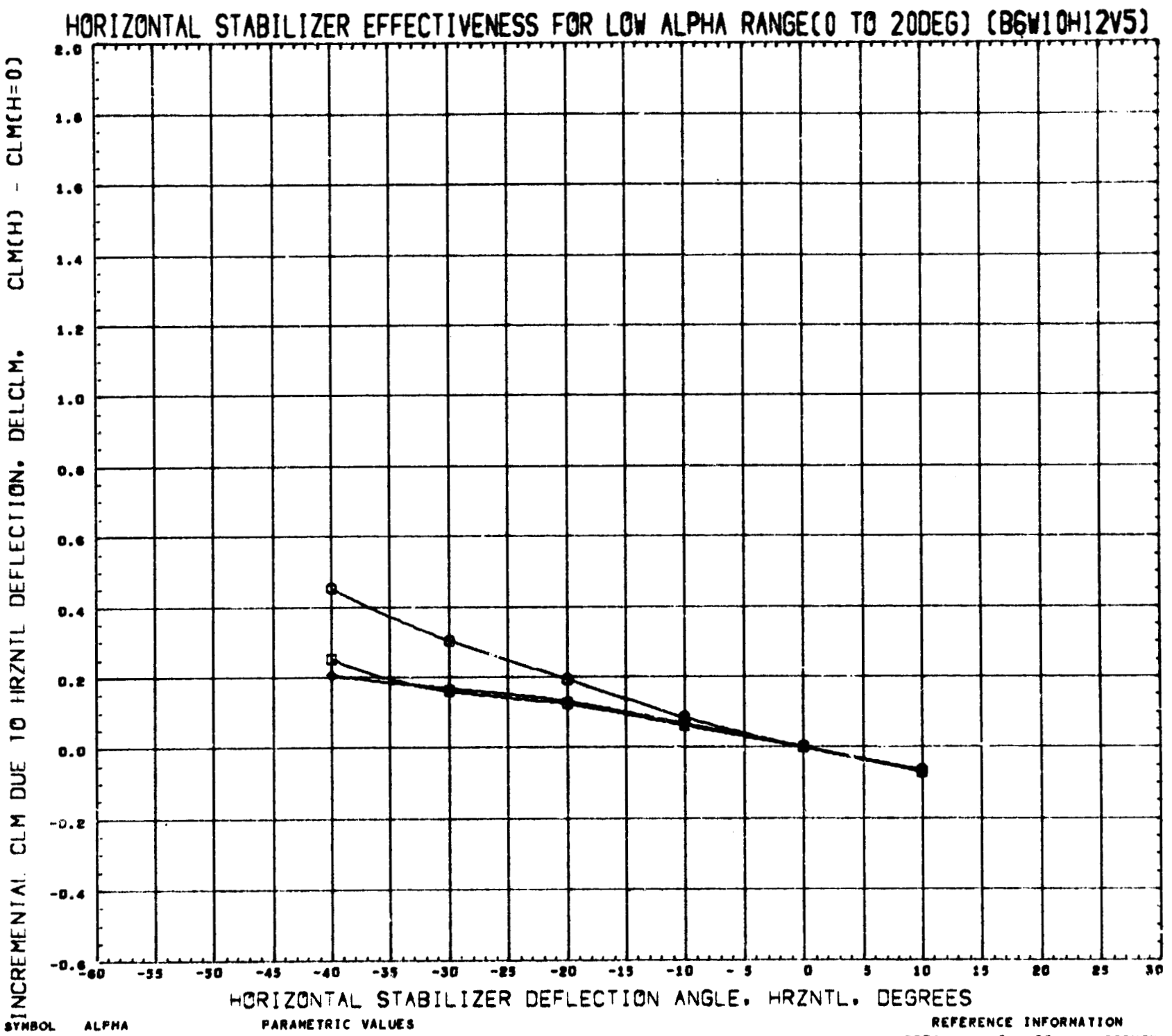
HORIZONTAL STABILIZER EFFECTIVENESS FOR LOW ALPHA RANGE(0 TO 20DEG) (B6W10H12V5)



SYMBOL	ALPHA		PARAMETRIC VALUES		
○	0.000	MACH	3.000	BETA	0.000
□	10.000				
◇	20.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

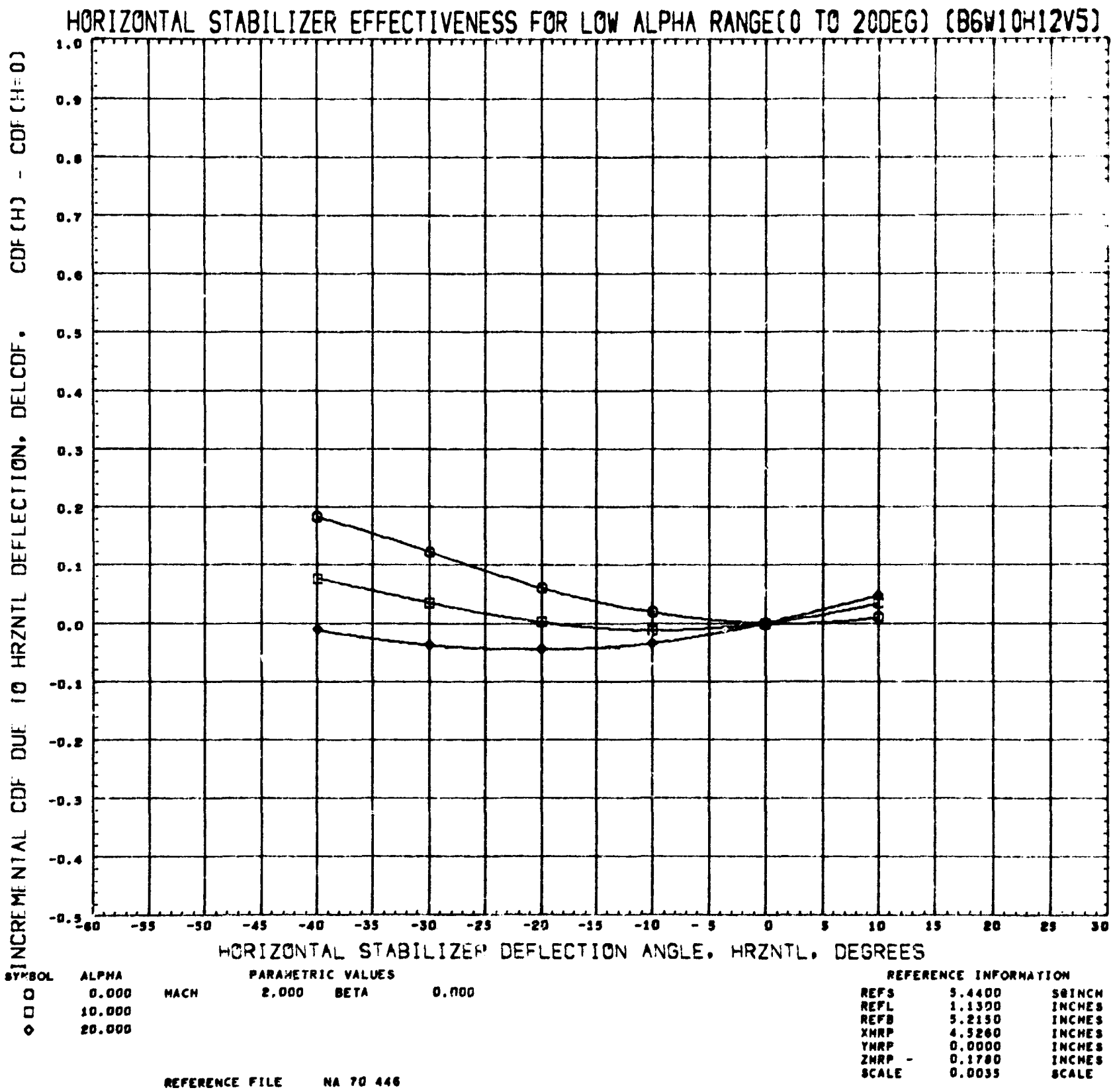


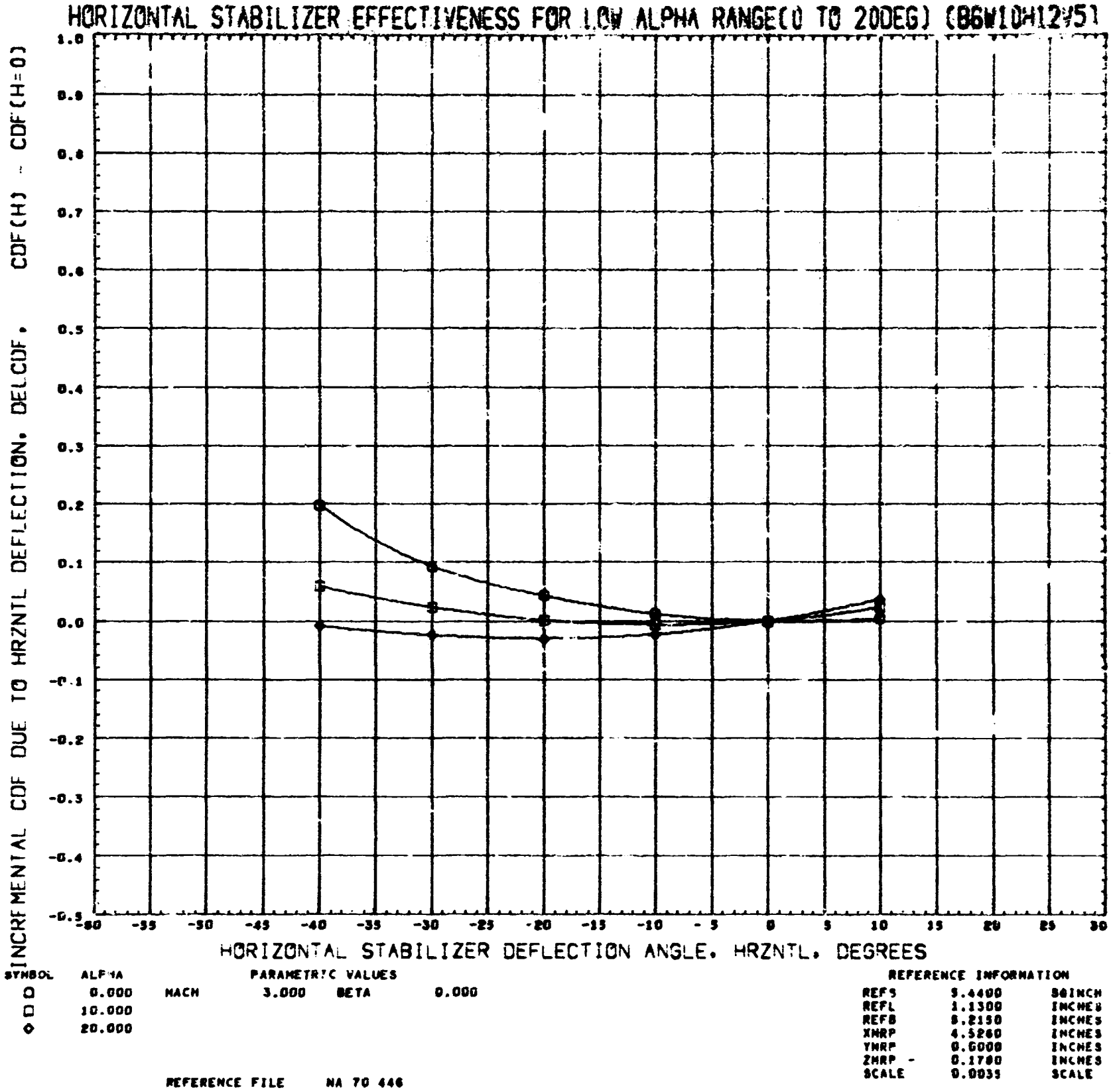
SYMBOL	ALPHA		PARAMETRIC VALUES		
○	0.000	MACH	5.000	BETA	0.000
□	10.000				
◇	20.000				

REFERENCE FILE NA 70 446

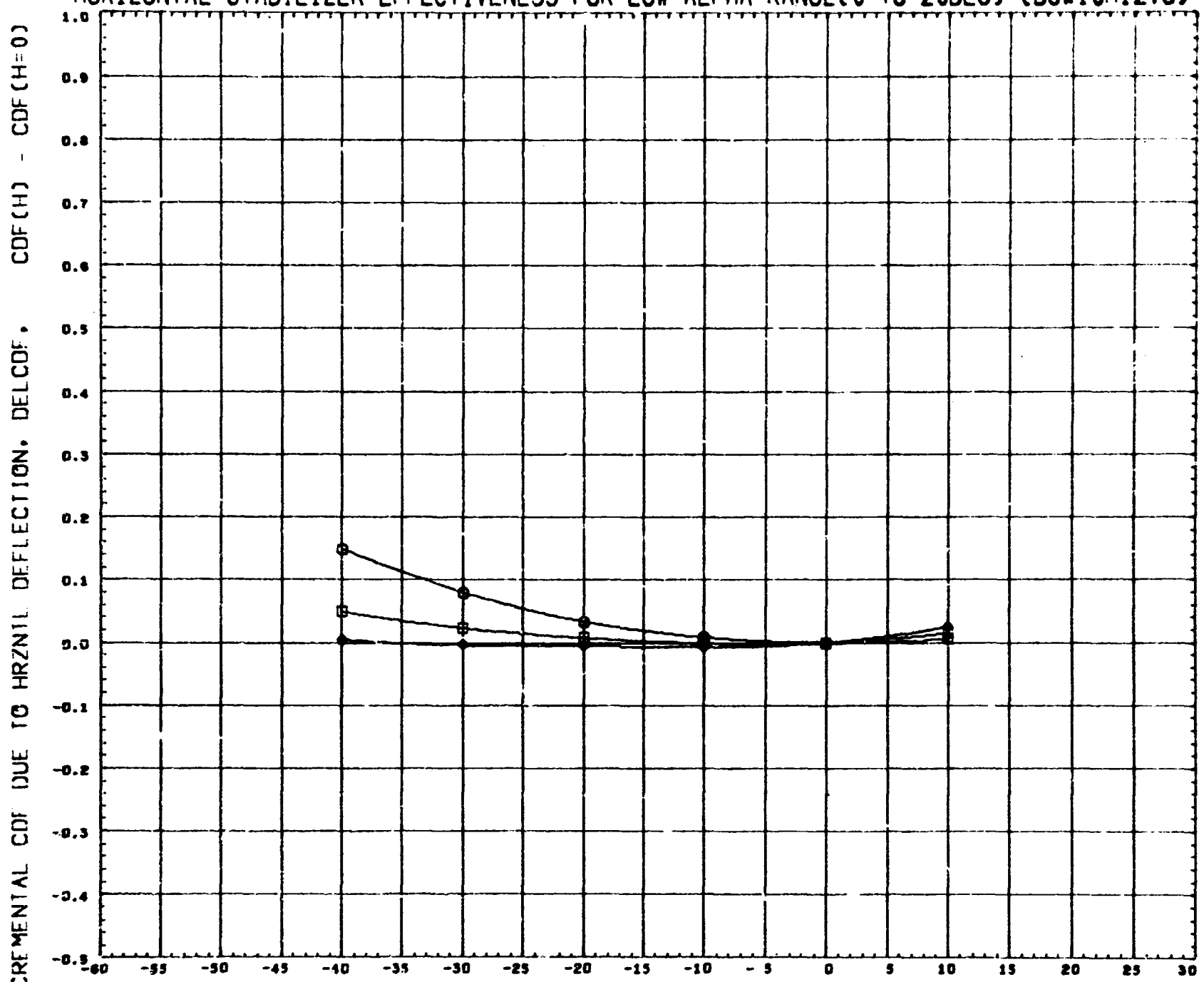
REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2190	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE


HORIZONTAL STABILIZER EFFECTIVENESS FOR LOW ALPHA RANGE(0 TO 20DEG) (B6W10H12V5)
INCREMENTAL CDF DUE TO HRZNTL DEFLECTION, DELCDF, CDF(H) - CDF(H=0)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
-60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30
HORIZONTAL STABILIZER DEFLECTION ANGLE, HRZNTL, DEGREES
SYMBOL ALPHA
0.000
10.000
20.000
PARAMETRIC VALUES
MACH 2.000 BETA 0.000
REFERENCE INFORMATION
REFS 5.4400 S@INCH
REFL 1.1300 INCHES
REFB 5.2150 INCHES
XMRP 4.5260 INCHES
YMRP 0.0000 INCHES
ZMRP - 0.1780 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA 70 446


HORIZONTAL STABILIZER EFFECTIVENESS FOR LOW ALPHA RANGE(0 TO 20DEG) (B6W10H12V5)
INCREMENTAL CDF DUE TO HRZNTL DEFLECTION, DELCDF, CDF(H) - CDF(H=0)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
-60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30
HORIZONTAL STABILIZER DEFLECTION ANGLE, HRZNTL, DEGREES
SYMBOL ALPHA
0.000
10.000
20.000
PARAMETRIC VALUES
MACH 3.000 BETA 0.000
REFERENCE INFORMATION
REFS 9.4400 SQINCH
REFL 1.1300 INCHES
REFB 8.2150 INCHES
XMRP 4.5260 INCHES
YMRP 0.0000 INCHES
ZMRP -0.1700 INCHES
SCALE 0.0033 SCALE
REFERENCE FILE NA 70 446

HORIZONTAL STABILIZER EFFECTIVENESS FOR LOW ALPHA RANGE(0 TO 20DEG) (B6W10H12V5)

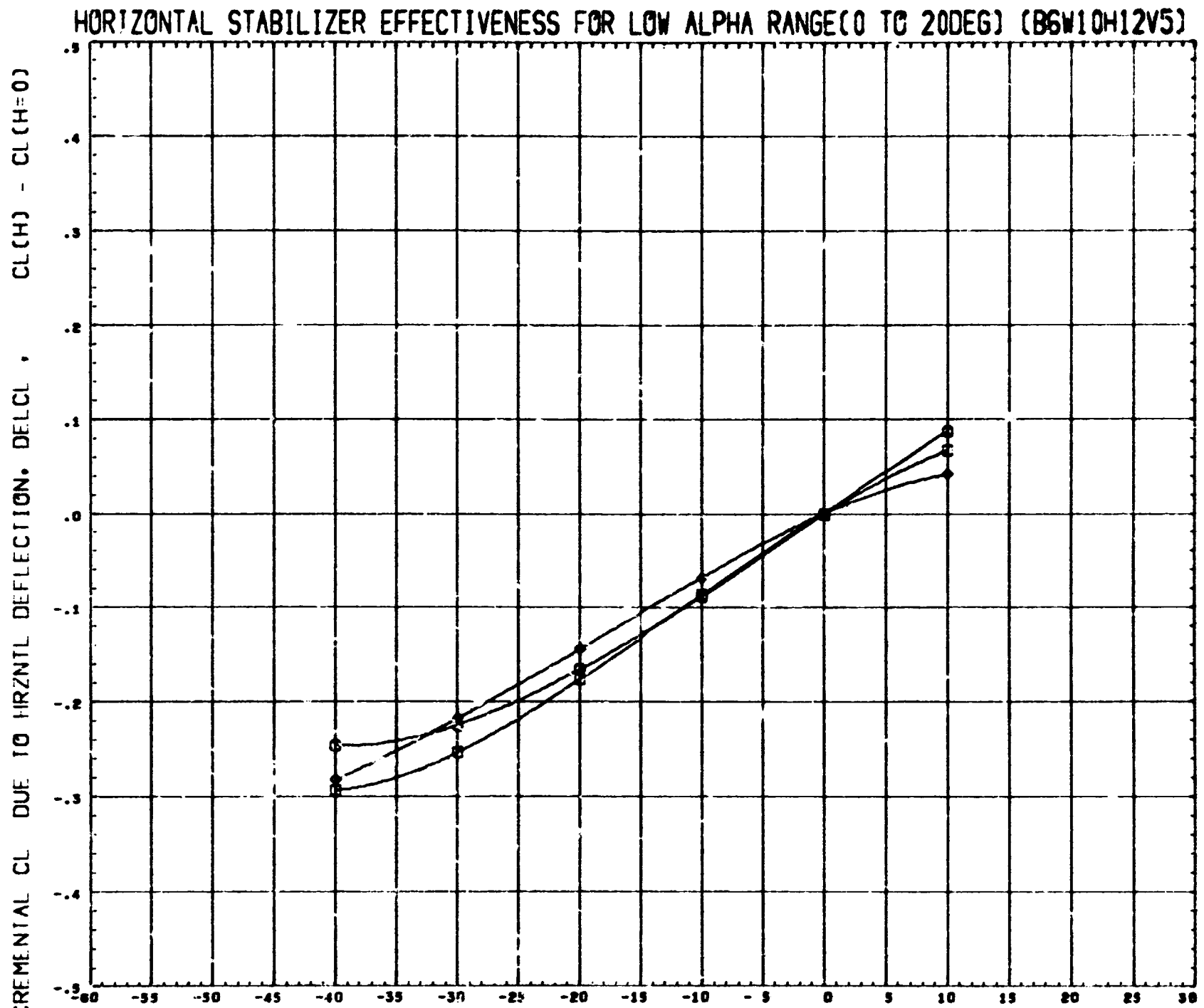


SYMBOL	ALPHA		PARAMETRIC VALUES		
○	0.000	MACH	5.000	BETA	0.000
□	10.000				
◇	20.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	0.1780	INCHES
SCALE	0.0 35	SCALE

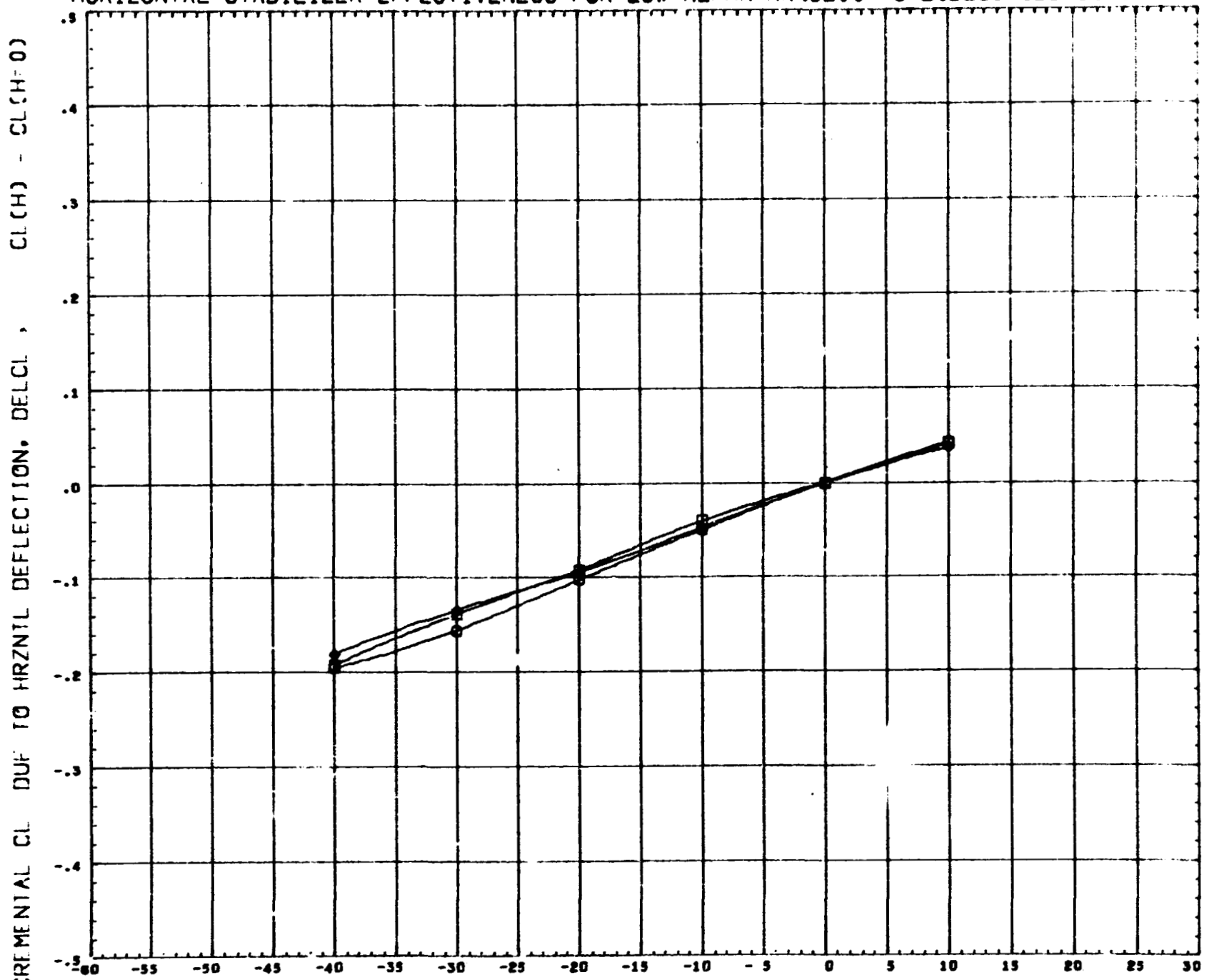


SYMBOL	ALPHA		PARAMETRIC VALUES		
○	0.000	MACH	2.000	BETA	0.000
□	10.000				
◇	20.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
YMRP	4.5260	INCHES
YNRP	0.0000	INCHES
ZNRP -	0.1780	INCHES
SCALE	0.0033	SCALE

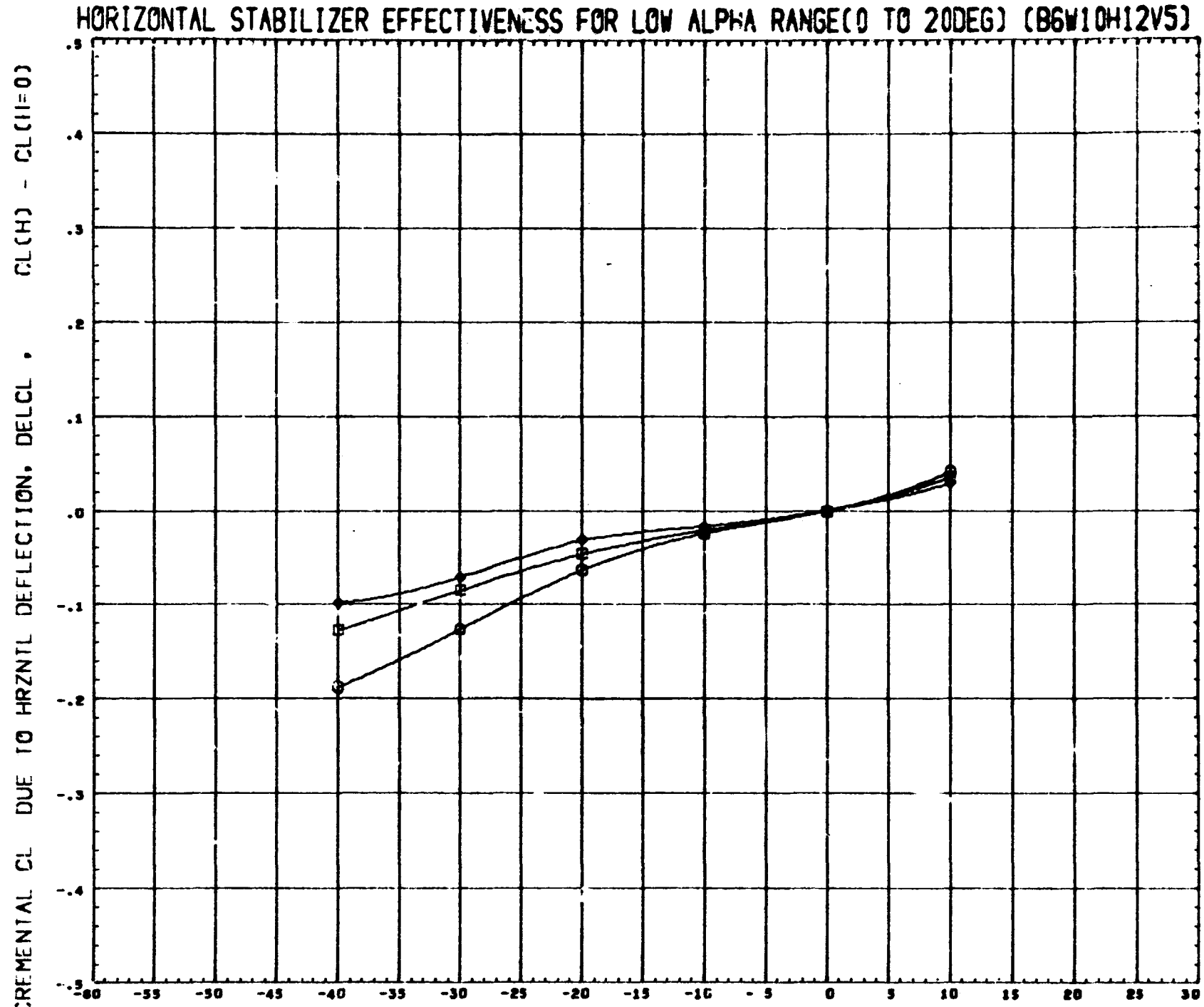
HORIZONTAL STABILIZER EFFECTIVENESS FOR LOW ALPHA RANGE(0 TO 20DEG) (B6W10H12V5)



SYMBOL	ALPHA	PARAMETRIC VALUES			
○	0.000	MACH	3.000	BETA	0.000
□	10.000				
◇	20.000				

REFERENCE FILE NA 70 446

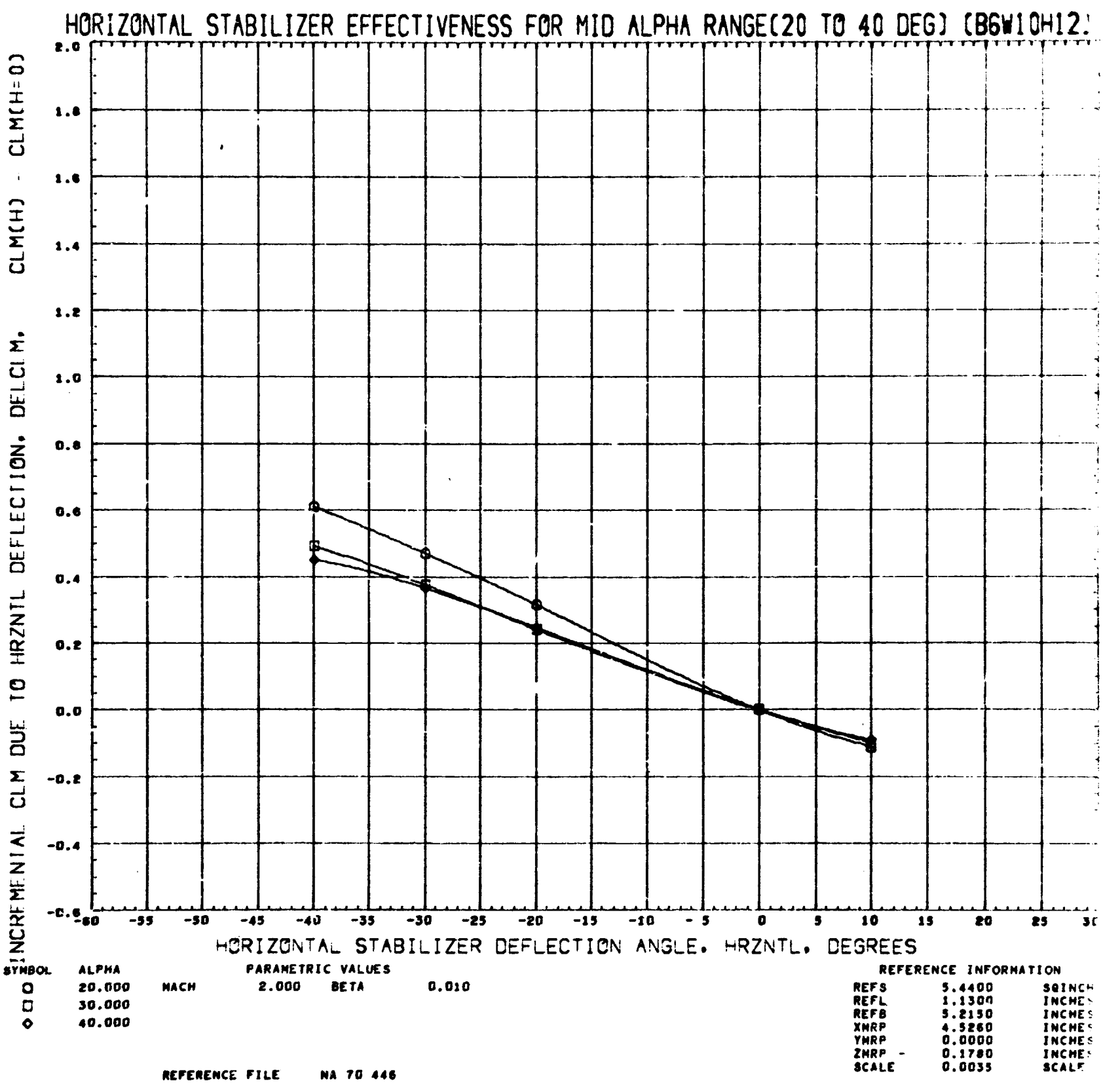
REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

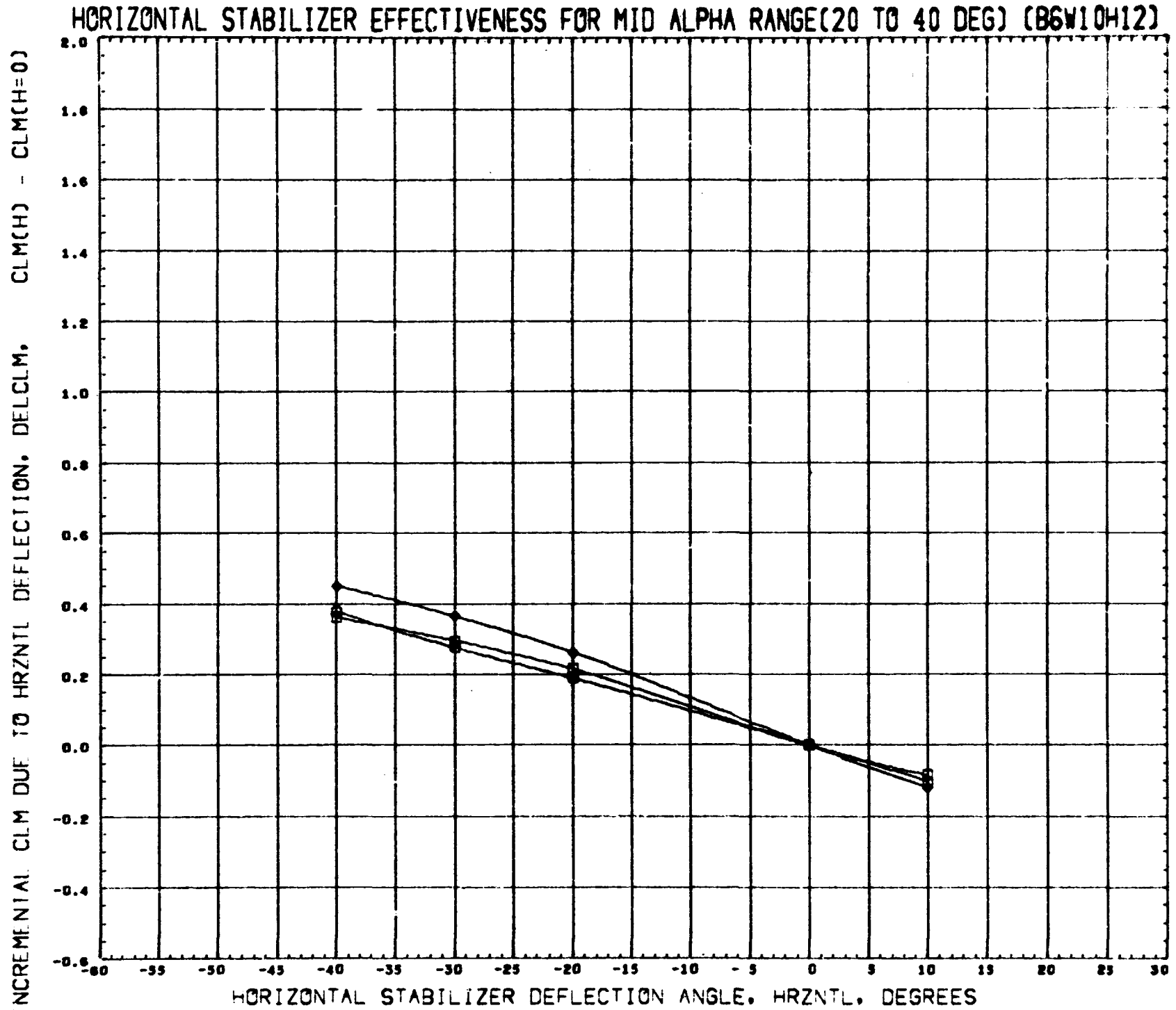


SYMBOL	ALPHA		PARAMETRIC VALUES		
○	0.000	MACH	5.000	BETA	0.000
□	10.000				
◇	20.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	9.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE


HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (B6W10H12
INCREMENTIAL CLM DUE TO HRZNTL DEFLECTION, DELCLM, CLM(H) - CLM(H=0)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30
HORIZONTAL STABILIZER DEFLECTION ANGLE, HRZNTL, DEGREES
SYMBOL ALPHA
○ 20.000
□ 30.000
◇ 40.000
PARAMETRIC VALUES
MACH 2.000 BETA 0.010
REFERENCE INFORMATION
REFS 5.4400 SQINCH
REFL 1.1300 INCHES
REFB 5.2150 INCHES
XMRP 4.5260 INCHES
YMRP 0.0000 INCHES
ZMRP - 0.1780 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA 70 446



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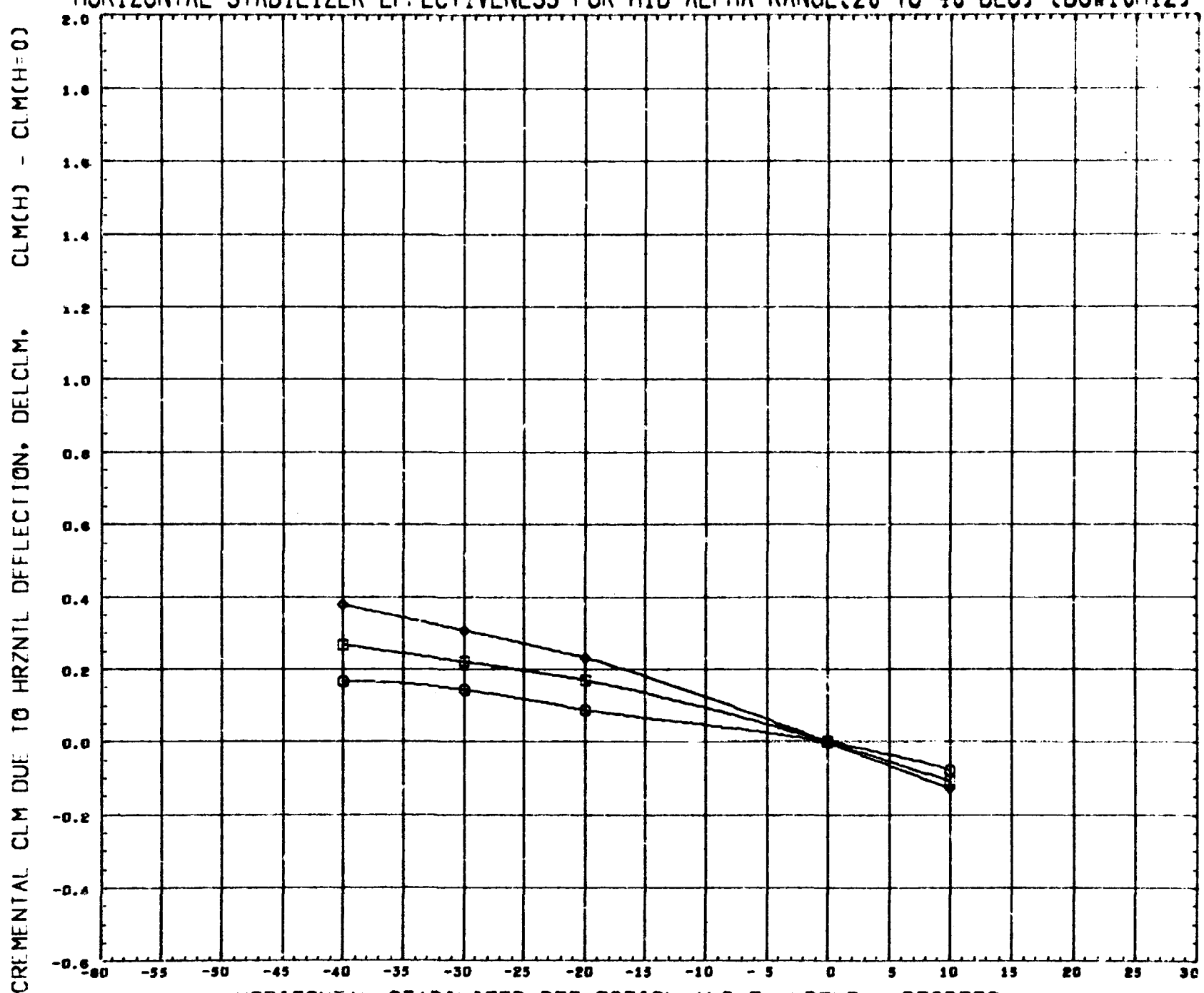
HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (B6W10H12)

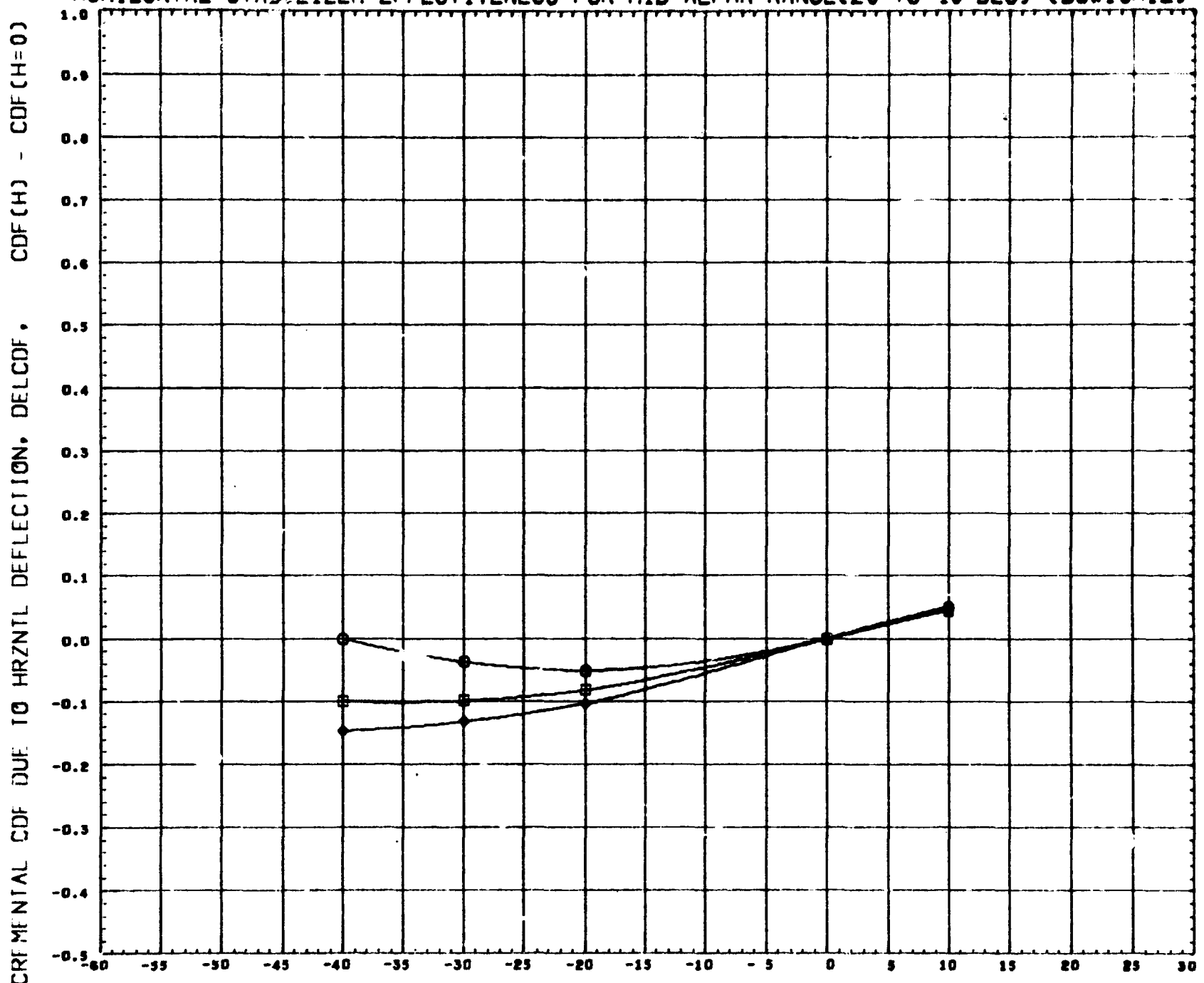


SYMBOL	ALPHA	PARAMETRIC VALUES			
○	20.000	MACH	5.000	BETA	0.010
□	30.000				
◇	40.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFS	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (B6W10H12)

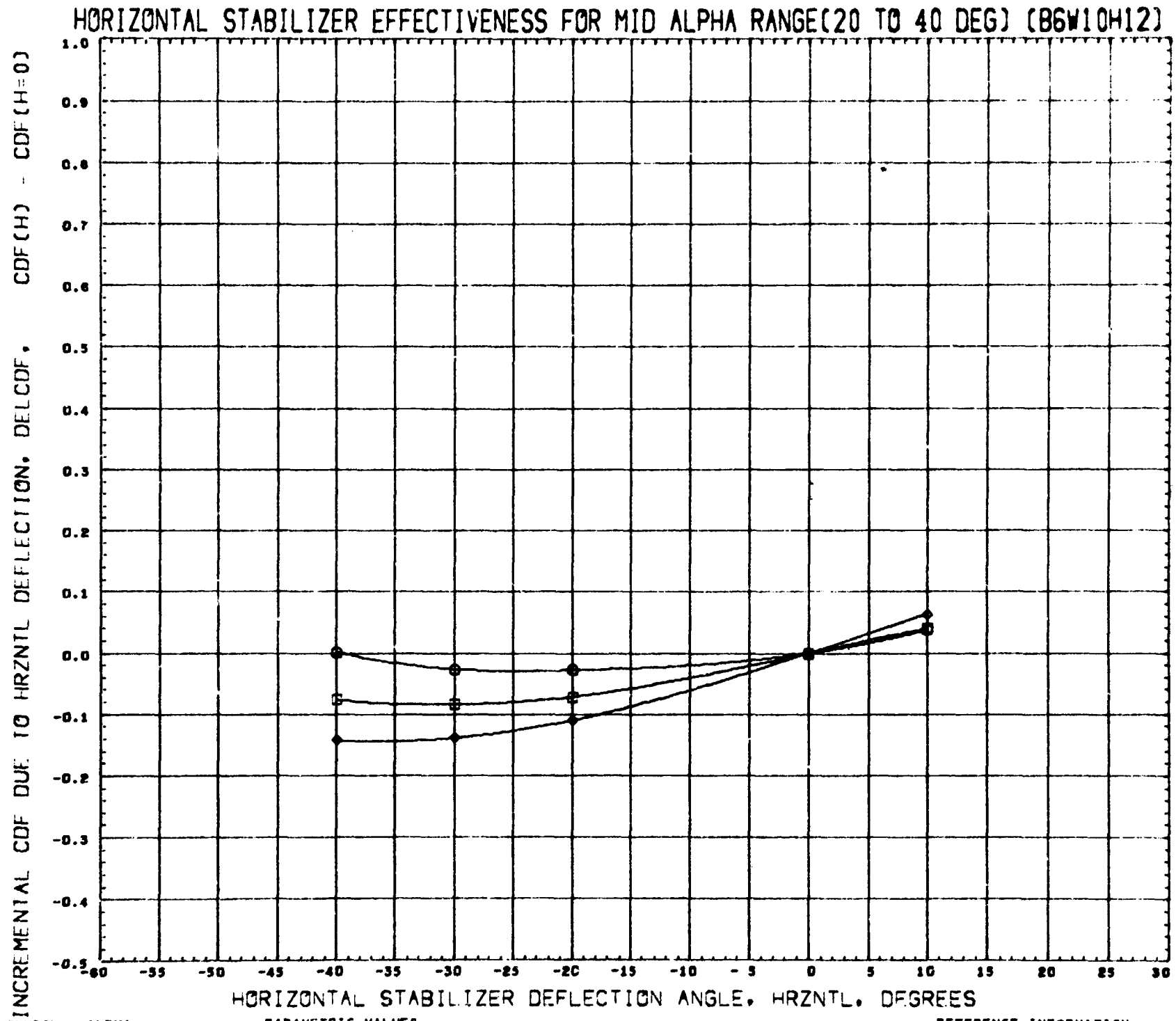


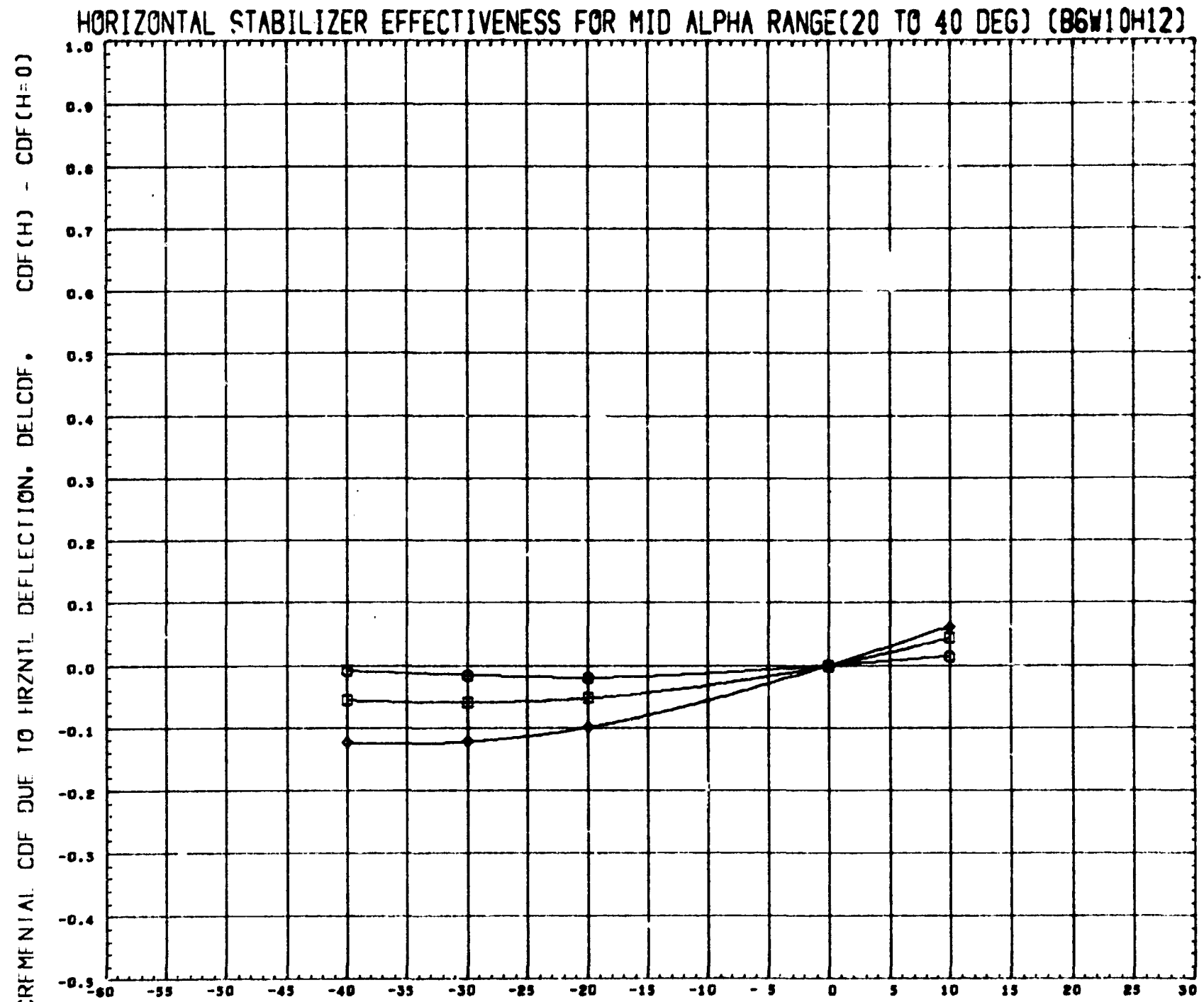
SYMBOL	ALPHA		PARAMETRIC VALUES		
○	20.000	MACH	2.000	BETA	0.010
□	30.000				
◇	40.000				

REFERENCE FILE NA 70 446

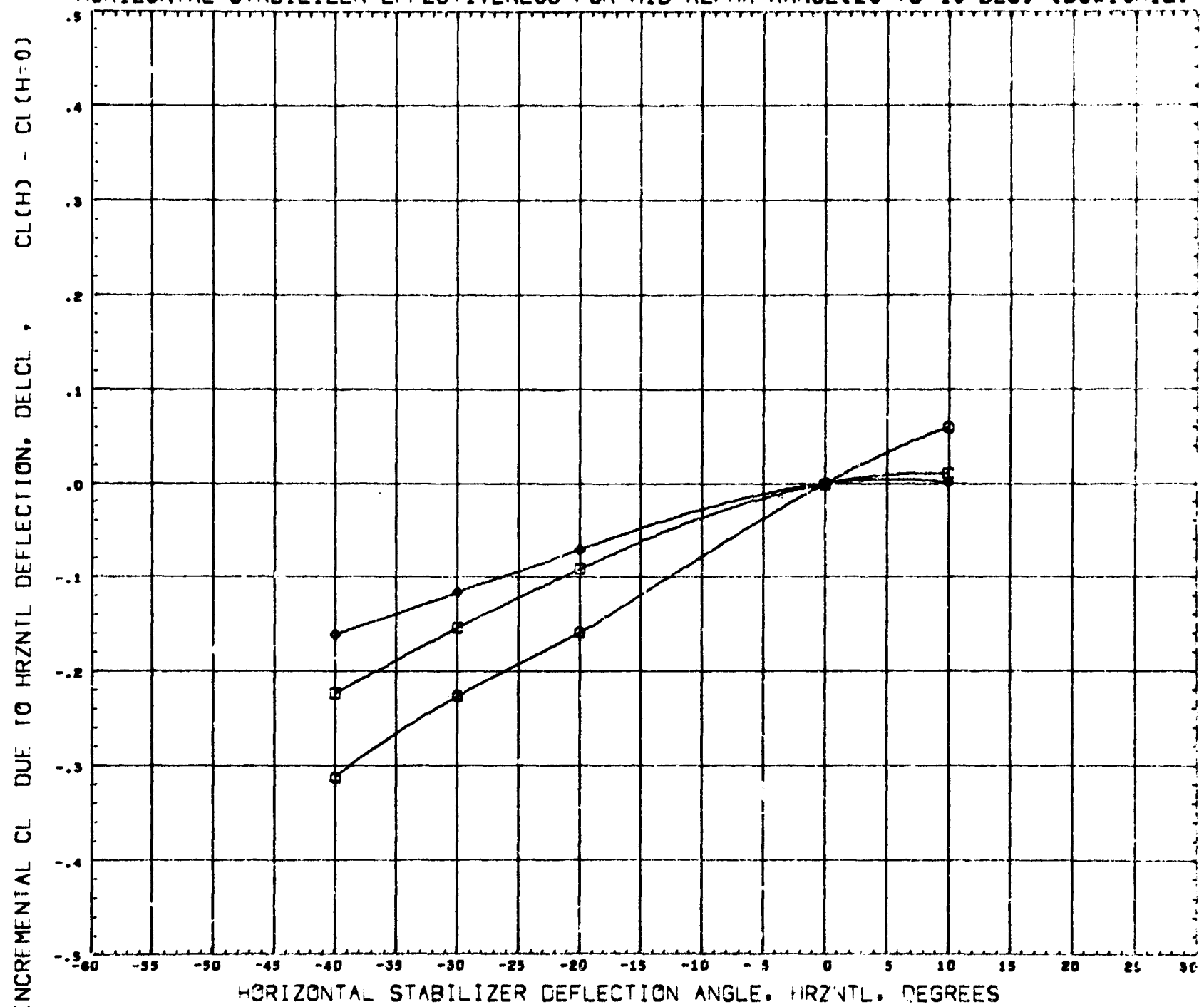
REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE


HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (B6W10H12)
INCREMENTIAL CDF DUE TO HRZNTL DEFLECTION, DELCDF, CDF(H) - CDF(H=0)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
-60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30
HORIZONTAL STABILIZER DEFLECTION ANGLE, HRZNTL, DEGREES
SYMBOL ALPHA
20.000
30.000
40.000
PARAMETRIC VALUES
MACH 3.000 BETA 0.010
REFERENCE INFORMATION
REFS 5.4400 SQINCH
REFL 1.1300 INCHES
REFB 5.2150 INCHES
XMRP 4.5260 INCHES
YMRP 0.0000 INCHES
ZMRP - 0.1780 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA 70 446


HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (B6W10H12)
INCREMENTAL CDF DUE TO HRZNTL DEFLECTION. DELCDF. CDF(H) - CDF(H=0)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
-60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30
HORIZONTAL STABILIZER DEFLECTION ANGLE. HRZNTL. DEGREES
SYMBOL ALPHA
20.000
30.000
40.000
PARAMETRIC VALUES
MACH 5.000 BETA 0.010
REFERENCE INFORMATION
REFS 5.4400 SQINCH
REFL 1.1300 INCHES
REFB 5.2150 INCHES
XMRP 4.5260 INCHES
YMRP 0.0000 INCHES
ZMRP - 0.1780 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA 70 446

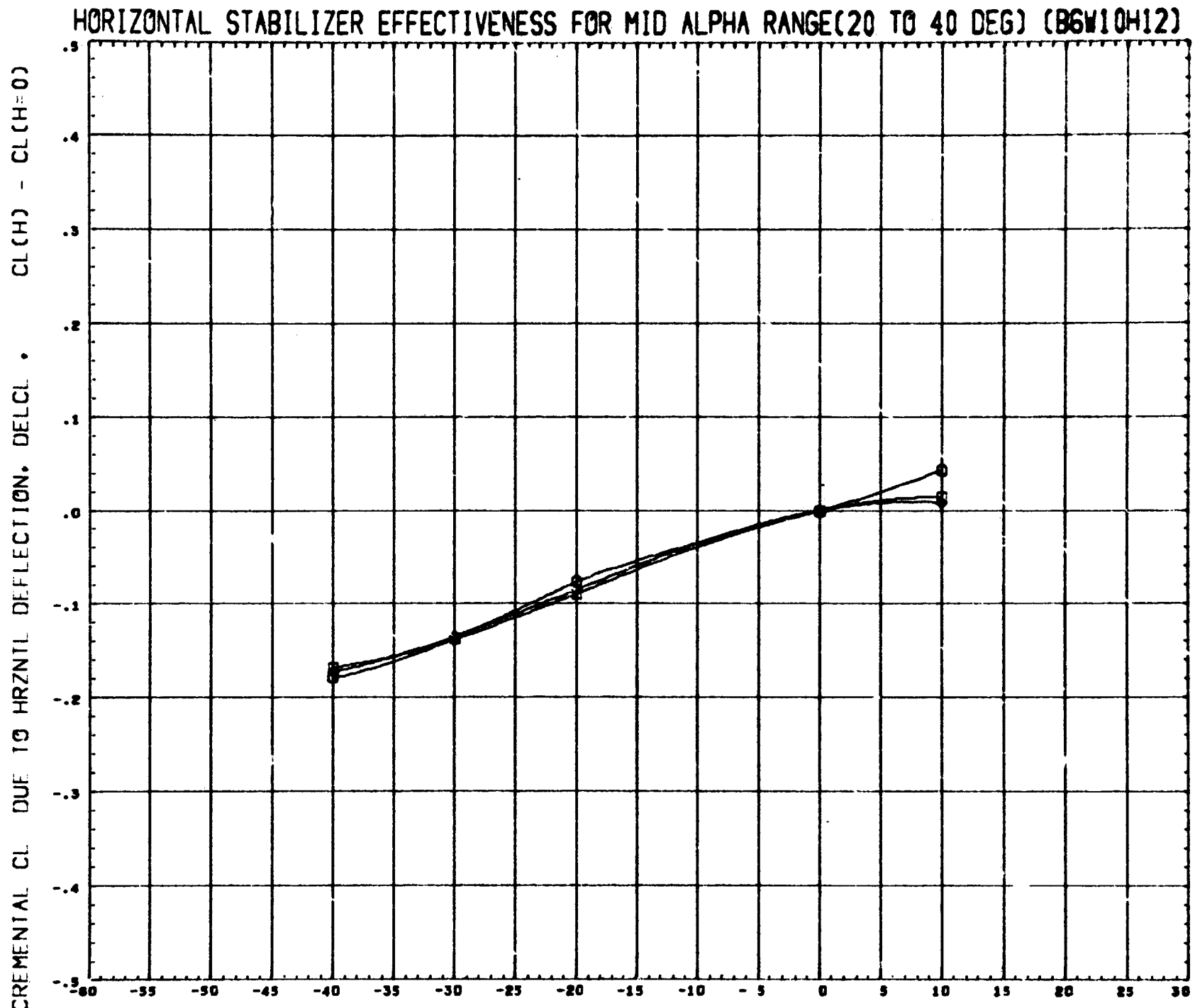
HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (B6W10H12)



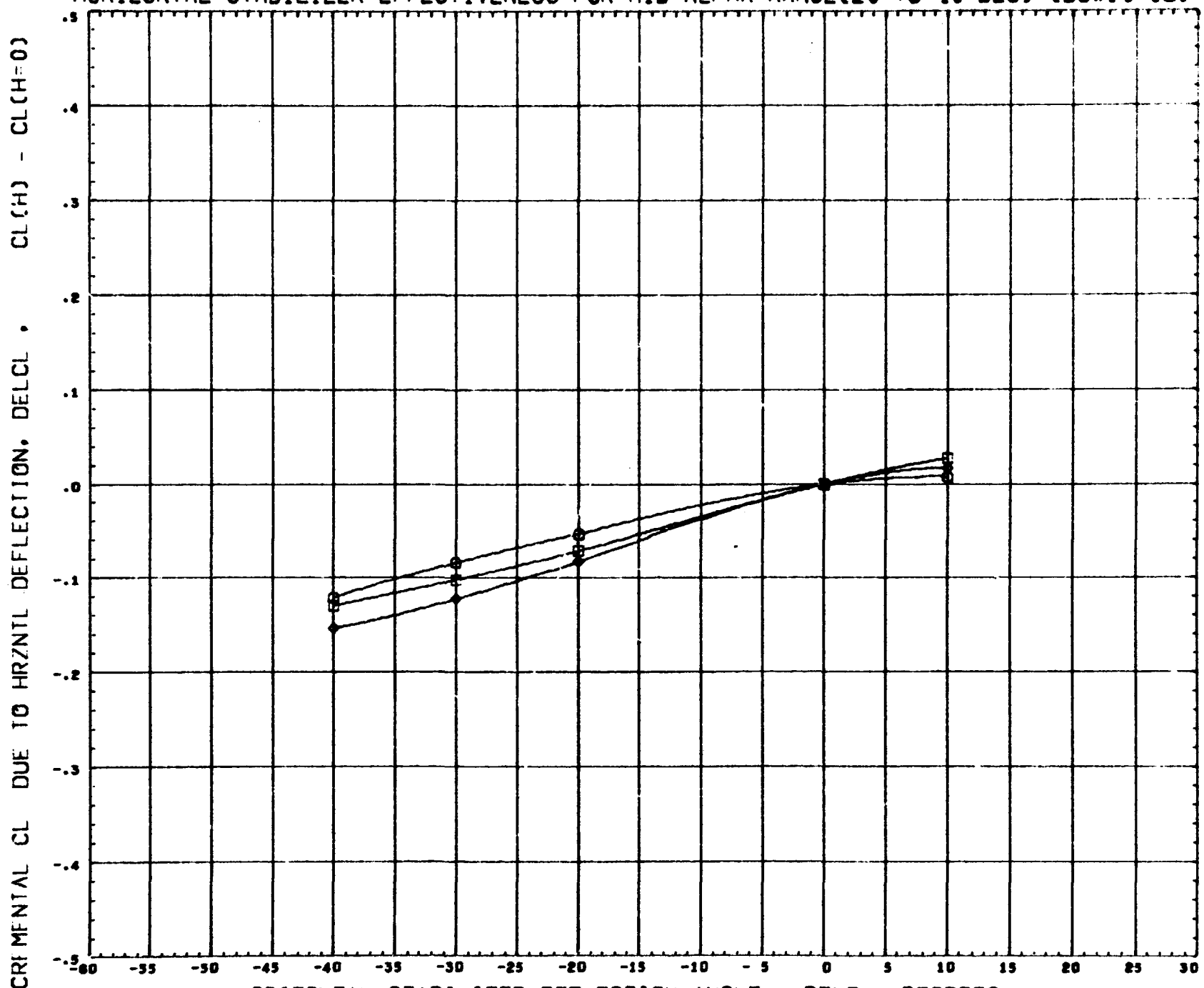
SYMBOL	ALPHA	PARAMETRIC VALUES			
○	20.000	MACH	2.000	BETA	0.010
□	30.000				
◇	40.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	0.1780	INCHES
SCALE	0.0035	SCALE


HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (B6W10H12)
INCREMENTAL CL DUE TO HRZNTL DEFLECTION, DELCL , CL(H) - CL(H=0)
.5
.4
.3
.2
.1
.0
-.1
-.2
-.3
-.4
-.5
-60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30
HORIZONTAL STABILIZER DEFLECTION ANGLE, HRZNTL, DEGREES
SYMBOL ALPHA
○ 20.000
□ 30.000
◇ 40.000
PARAMETRIC VALUES
MACH 3.000 BETA 0.010
REFERENCE INFORMATION
REFS 5.4400 SQINCH
REFL 1.1300 INCHES
REFB 5.8150 INCHES
XMRP 4.3260 INCHES
YMRP 0.0000 INCHES
ZMRP -0.1700 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA 70 446

HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (B6W10H12)

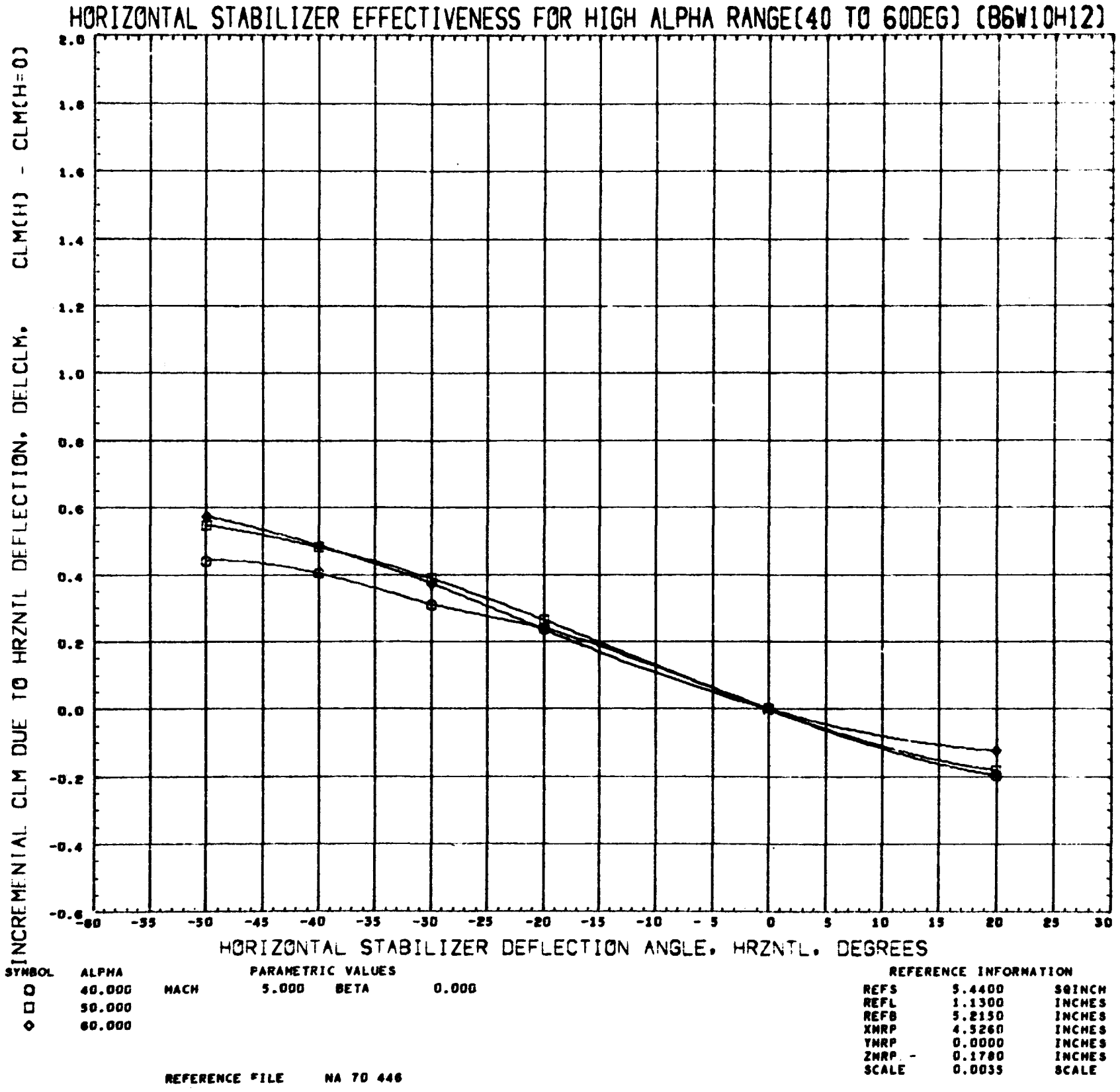


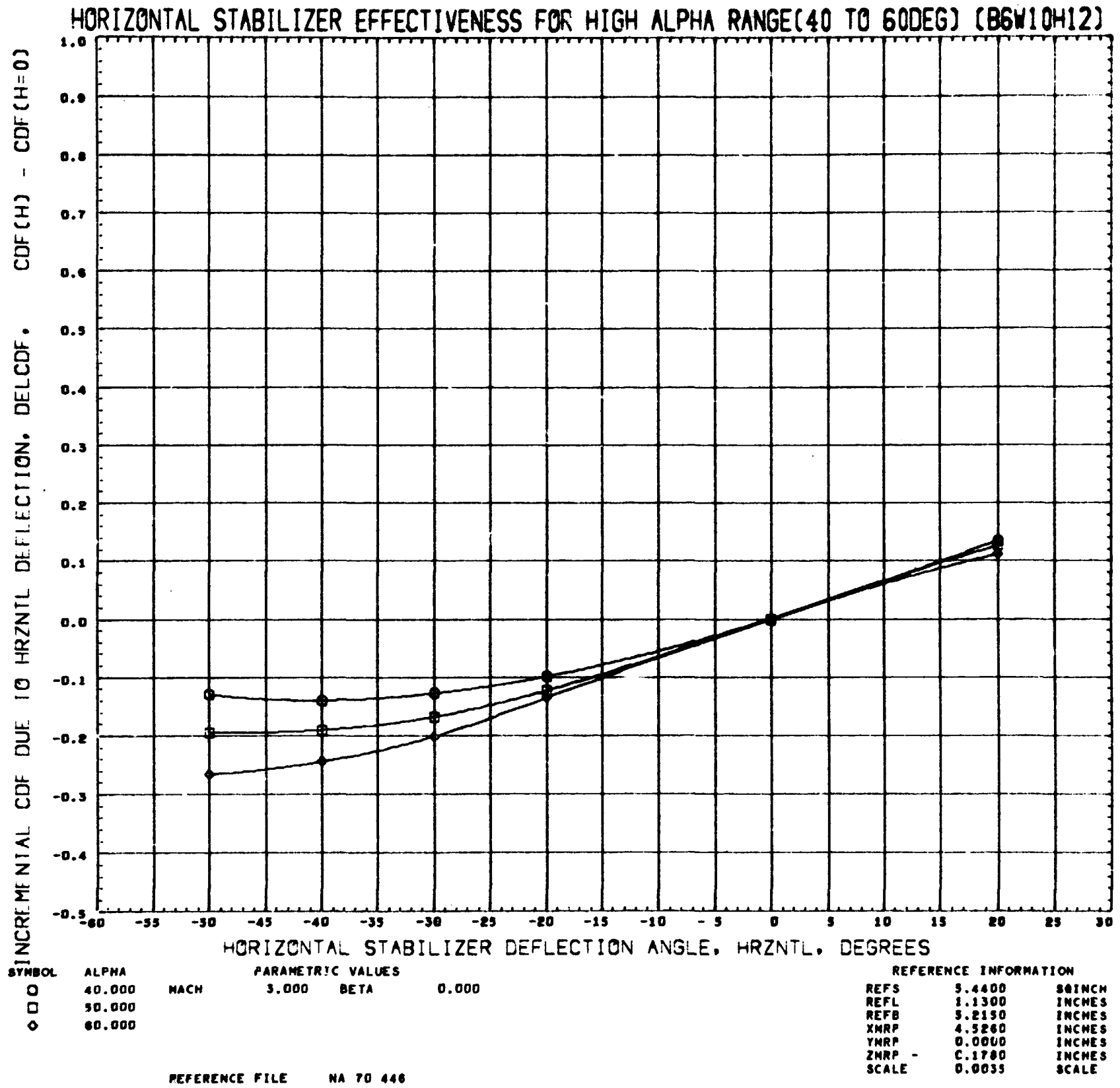
SYMBOL	ALPHA	PARAMETRIC VALUES			
○	20.000	MACH	5.000	BETA	0.010
□	30.000				
◇	40.000				

REFERENCE FILE NA 70 446

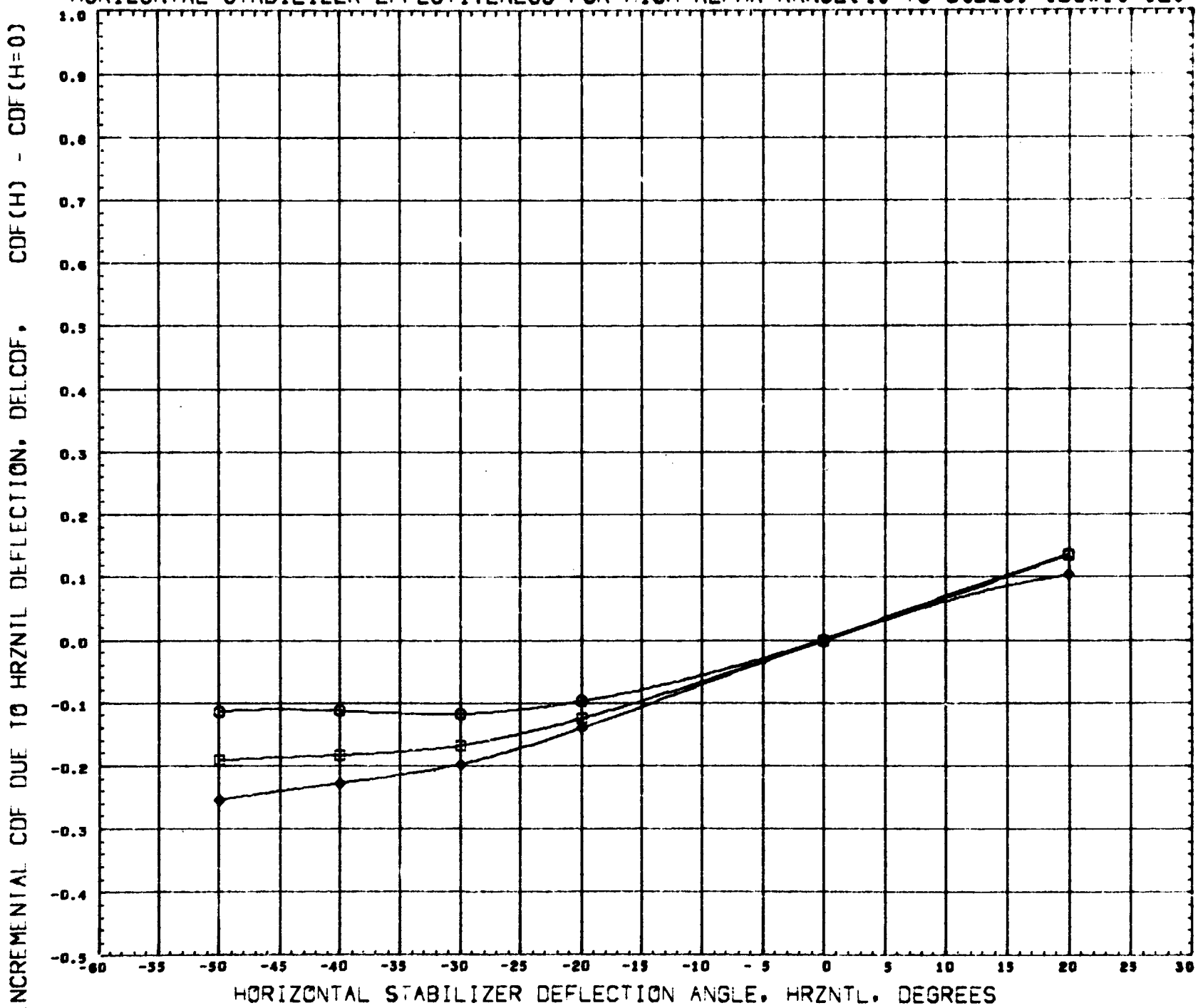
REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	0.1780	INCHES
SCALE	0.0035	SCALE


HORIZONTAL STABILIZER EFFECTIVENESS FOR HIGH ALPHA RANGE(40 TO 60DEG) (B6W10H12)
INCREMENTIAL CLM DUE TO HRZNTL DEFLECTION, DELCLM, CLM(H) - CLM(H=0)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30
HORIZONTAL STABILIZER DEFLECTION ANGLE, HRZNTL, DEGREES
SYMBOL ALPHA
○ 40.000
□ 50.000
◇ 60.000
PARAMETRIC VALUES
MACH 3.000 BETA 0.000
REFERENCE INFORMATION
REFS 5.4400 SQINCH
REFL 1.1300 INCHES
REFB 5.2150 INCHES
XMRP 4.5260 INCHES
YMRP 0.0000 INCHES
ZMRP - 0.1780 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA 70 446


HORIZONTAL STABILIZER EFFECTIVENESS FOR HIGH ALPHA RANGE(40 TO 60DEG) (B6W10H12)
INCREMENTIAL CLM DUE TO HRZNTL DEFLECTION, DELCLM.
CLM(H) - CLM(H=0)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30
HORIZONTAL STABILIZER DEFLECTION ANGLE, HRZNTL, DEGREES
SYMBOL ALPHA
O 40.000
□ 50.000
◇ 60.000
PARAMETRIC VALUES
MACH 5.000 BETA 0.000
REFERENCE INFORMATION
REFS 5.4400 SQINCH
REFL 1.1300 INCHES
REFB 5.2150 INCHES
XMRP 4.5260 INCHES
YMRP 0.0000 INCHES
ZMRP - 0.1780 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA 70 446


HORIZONTAL STABILIZER EFFECTIVENESS FOR HIGH ALPHA RANGE(40 TO 60DEG) (B6W10H12)
INCREMENTIAL CDF DUE TO HRZNTL DEFLECTION, DELCDF, CDF(H) - CDF(H=0)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
-60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30
HORIZONTAL STABILIZER DEFLECTION ANGLE, HRZNTL, DEGREES
SYMBOL ALPHA
O 40.000
□ 50.000
◇ 60.000
PARAMETRIC VALUES
MACH 3.000 BETA 0.000
REFERENCE FILE NA 70 446
REFERENCE INFORMATION
REFS 5.4400 SQINCH
REFL 1.1300 INCHES
REFB 5.2150 INCHES
XMRP 4.5260 INCHES
YMRP 0.0000 INCHES
ZMRP - C.1780 INCHES
SCALE 0.0035 SCALE

HORIZONTAL STABILIZER EFFECTIVENESS FOR HIGH ALPHA RANGE(40 TO 60DEG) (B6W10H12)

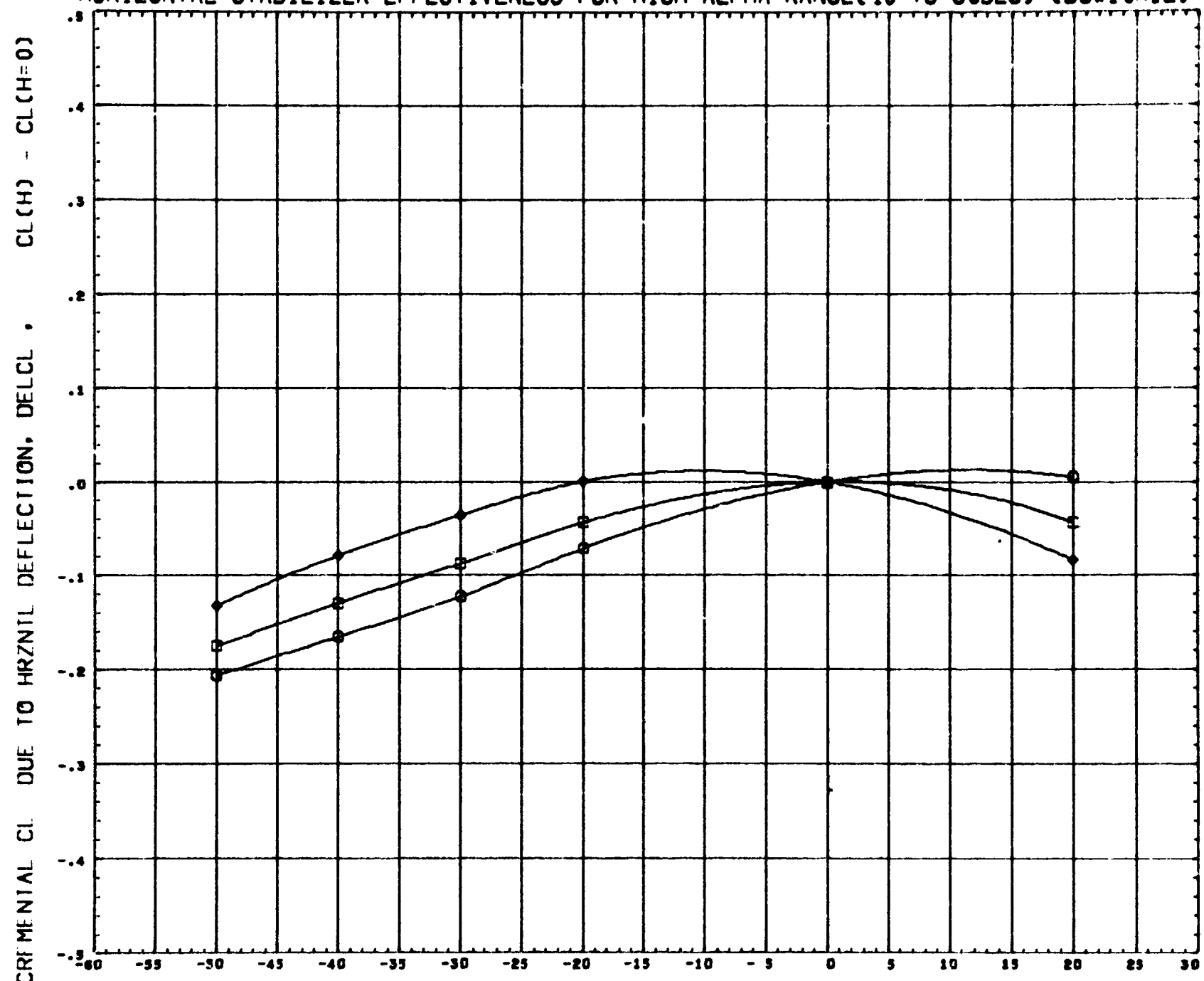


SYMBOL	ALPHA		PARAMETRIC VALUES		
○	40.000	MACH	5.000	BETA	0.000
□	50.000				
◇	60.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTIVENESS FOR HIGH ALPHA RANGE(40 TO 60DEG) (B6W10H12)

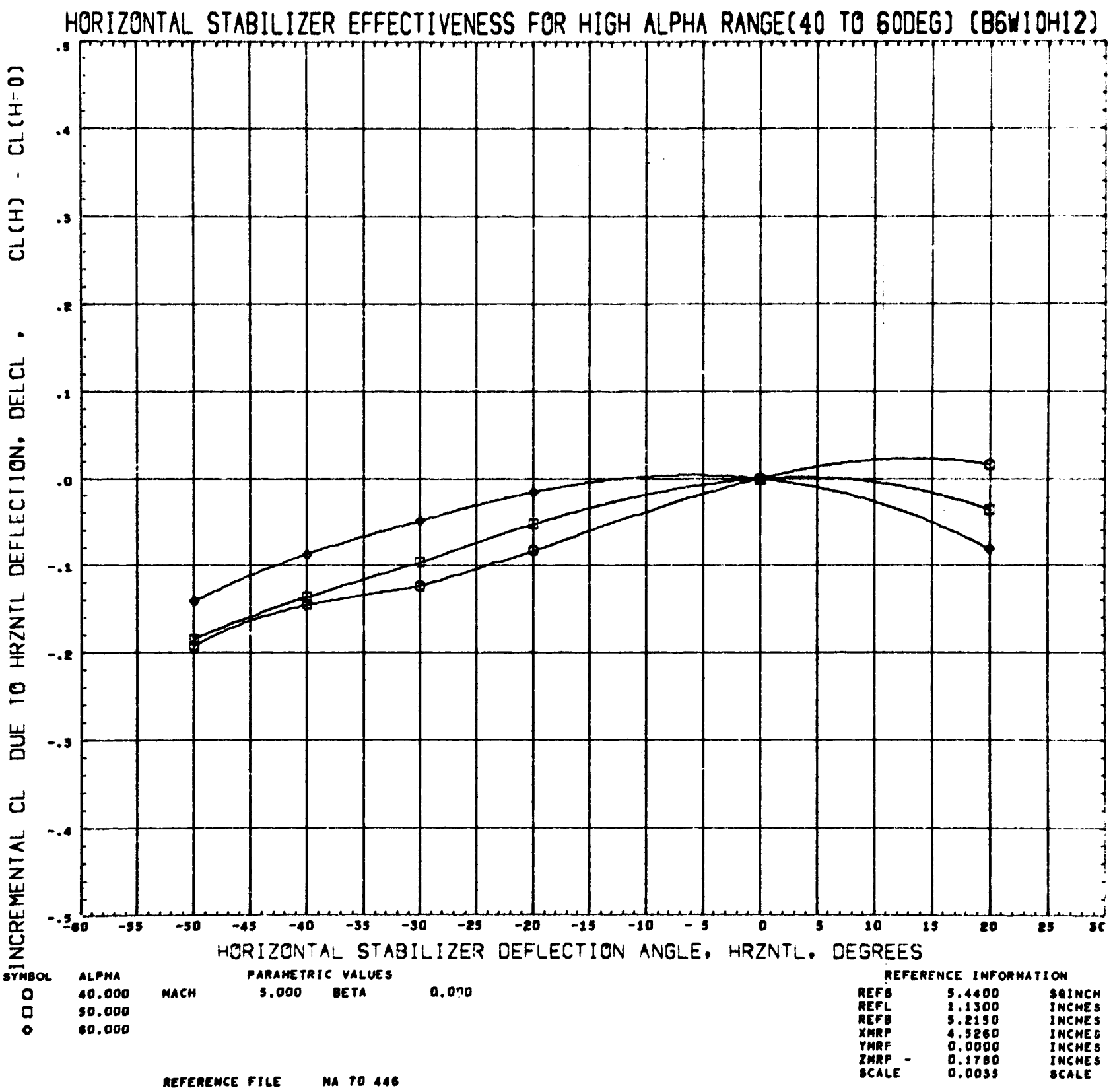


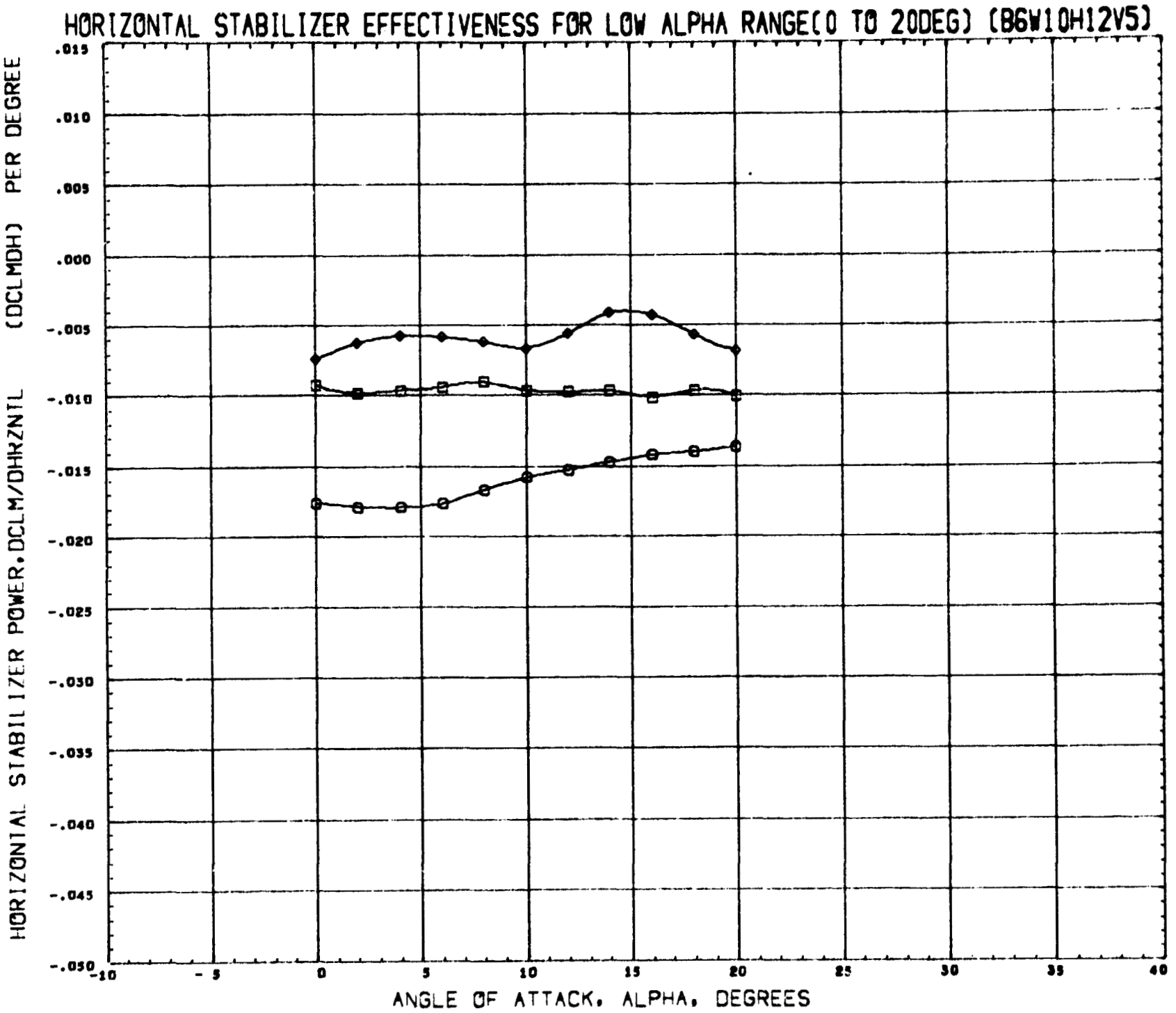
SYMBOL	ALPHA		PARAMETRIC VALUES		
○	40.000	MACH	3.000	BETA	0.000
□	50.000				
◇	60.000				

REFERENCE FILE NA 70 446

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE


HORIZONTAL STABILIZER EFFECTIVENESS FOR HIGH ALPHA RANGE(40 TO 60DEG) (B6W1OH12)
INCREMENTAL CL DUE TO HRZNTL DEFLECTION, DELCL = CL(H) - CL(H-0)
.5
.4
.3
.2
.1
.0
-.1
-.2
-.3
-.4
-.5
-60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30
HORIZONTAL STABILIZER DEFLECTION ANGLE, HRZNTL, DEGREES
SYMBOL ALPHA
40.000
50.000
60.000
PARAMETRIC VALUES
MACH 5.000 BETA 0.000
REFERENCE INFORMATION
REFS 5.4400 SQINCH
REFL 1.1300 INCHES
REFB 5.2150 INCHES
XMRP 4.5260 INCHES
YMRF 0.0000 INCHES
ZMRP - 0.1780 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA 70 446



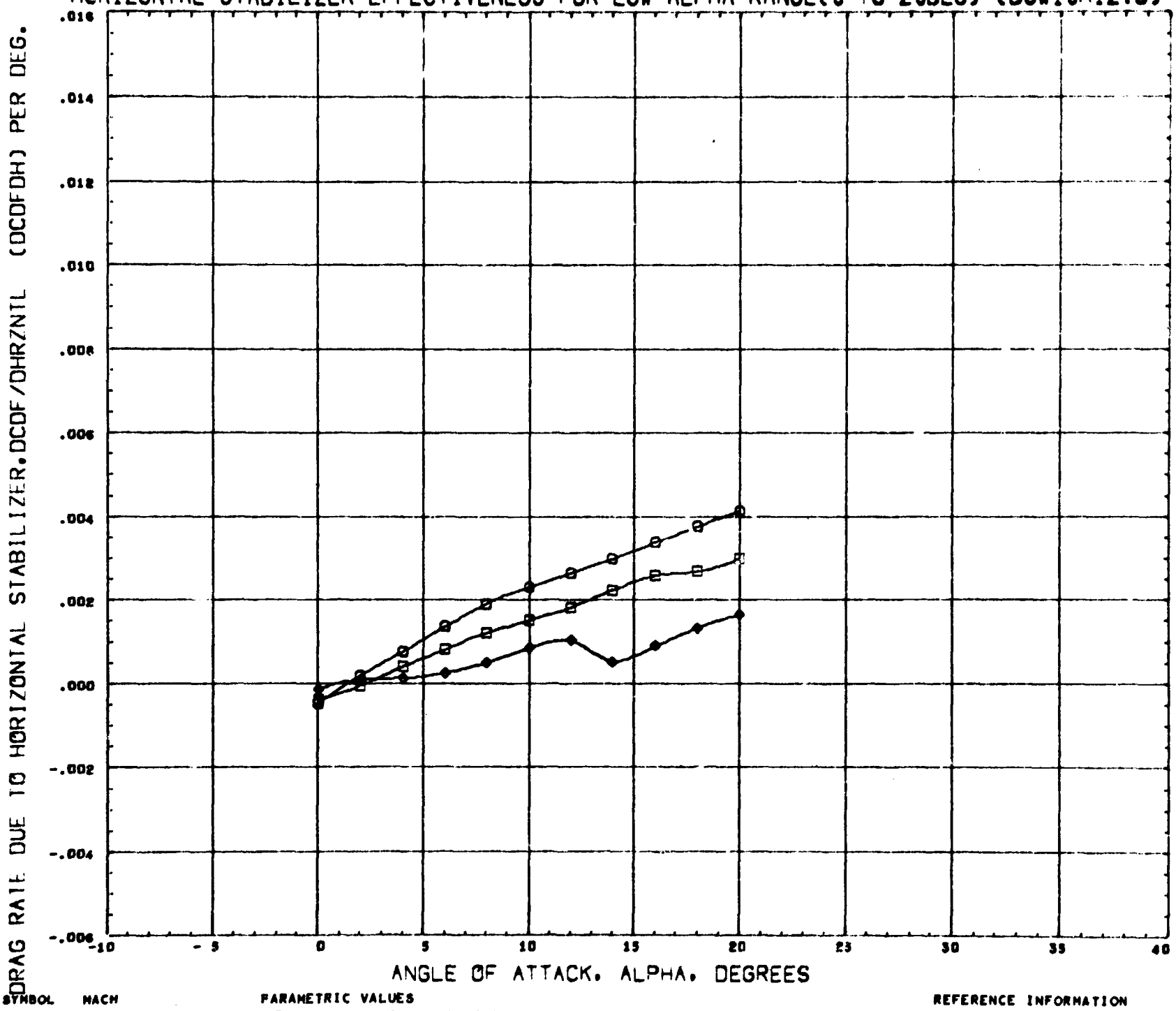
SYMBOL	MACH		PARAMETRIC VALUES		
○	2.000	BETA	0.000	HRZNTL	- 10.000
□	3.000				
◇	5.000				

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE

HORIZONTAL STABILIZER EFFECTIVENESS FOR LOW ALPHA RANGE(0 TO 20DEG) (B6W10H12V5)



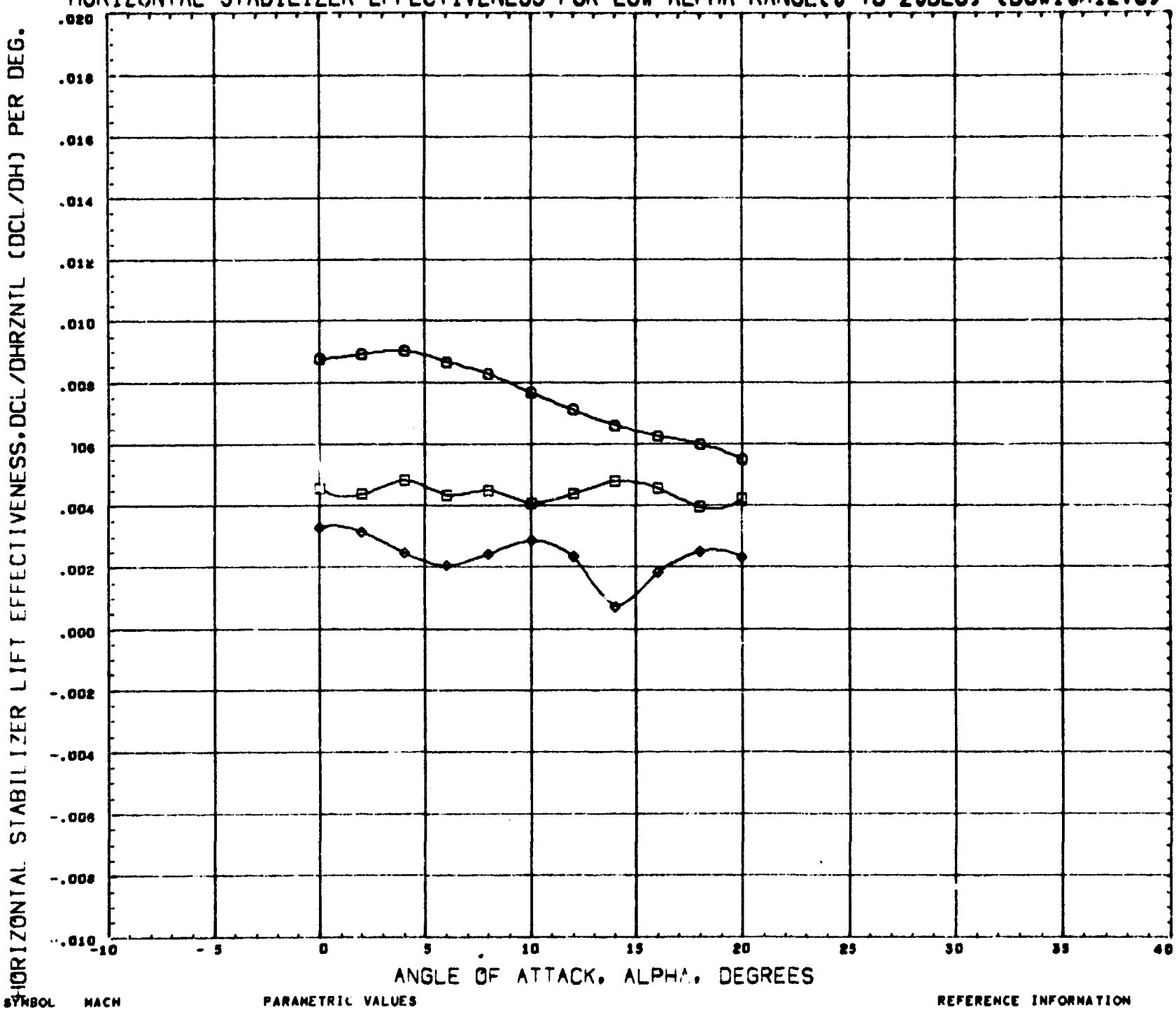
SYMBOL	MACH	PARAMETRIC VALUES		
○	2.000	BETA	0.000	HRZNTL - 10.000
□	3.000			
◇	5.000			

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE

HORIZONTAL STABILIZER EFFECTIVENESS FOR LOW ALPHA RANGE(0 TO 20DEG) (B6W10H12V5)



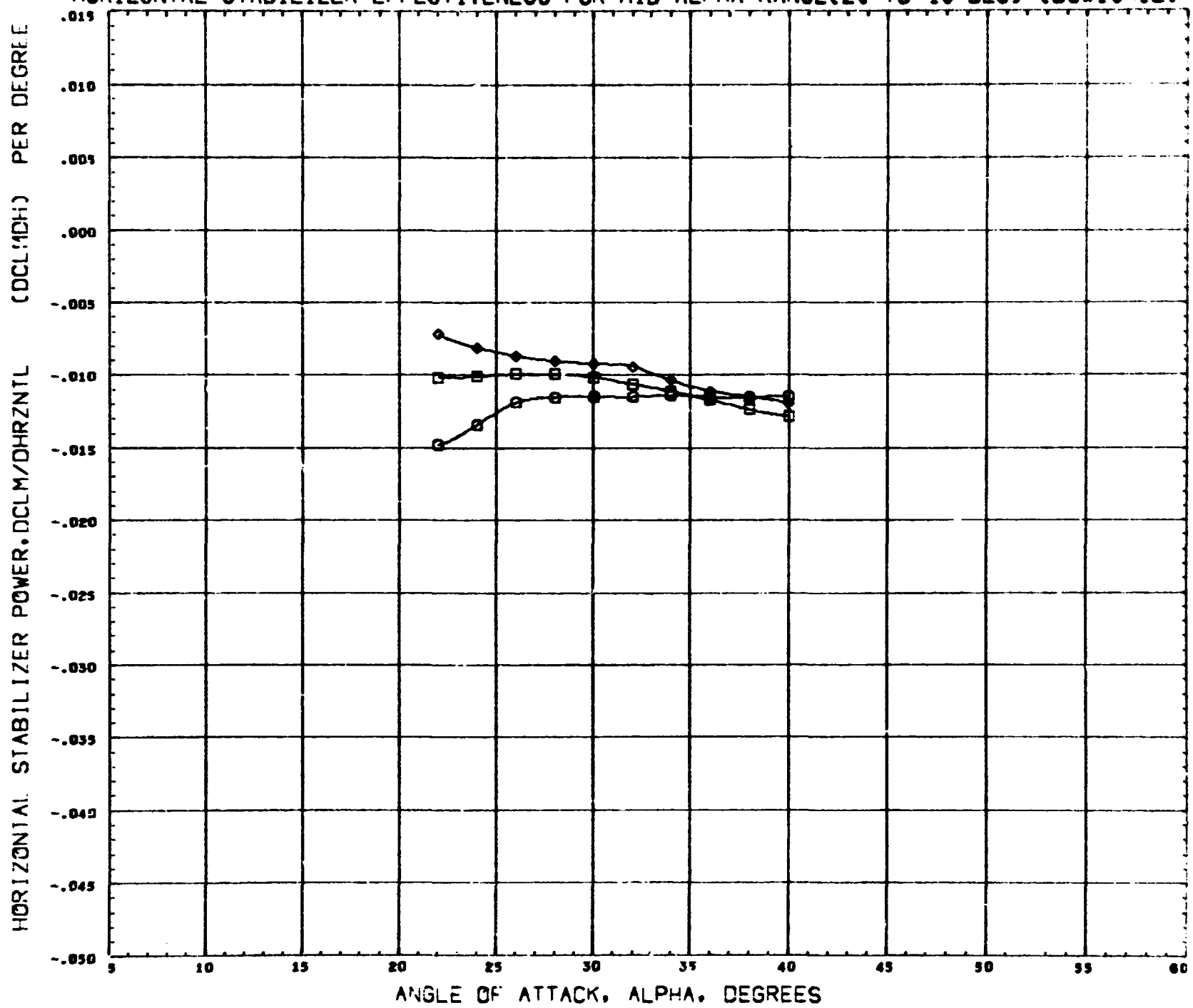
SYMBOL	MACH		PARAMETRIC VALUES		
○	2.000	BETA	0.000	HRZNTL	- 10.000
□	3.000				
◇	5.000				

REFERENCE FILE

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (B6W10H12)



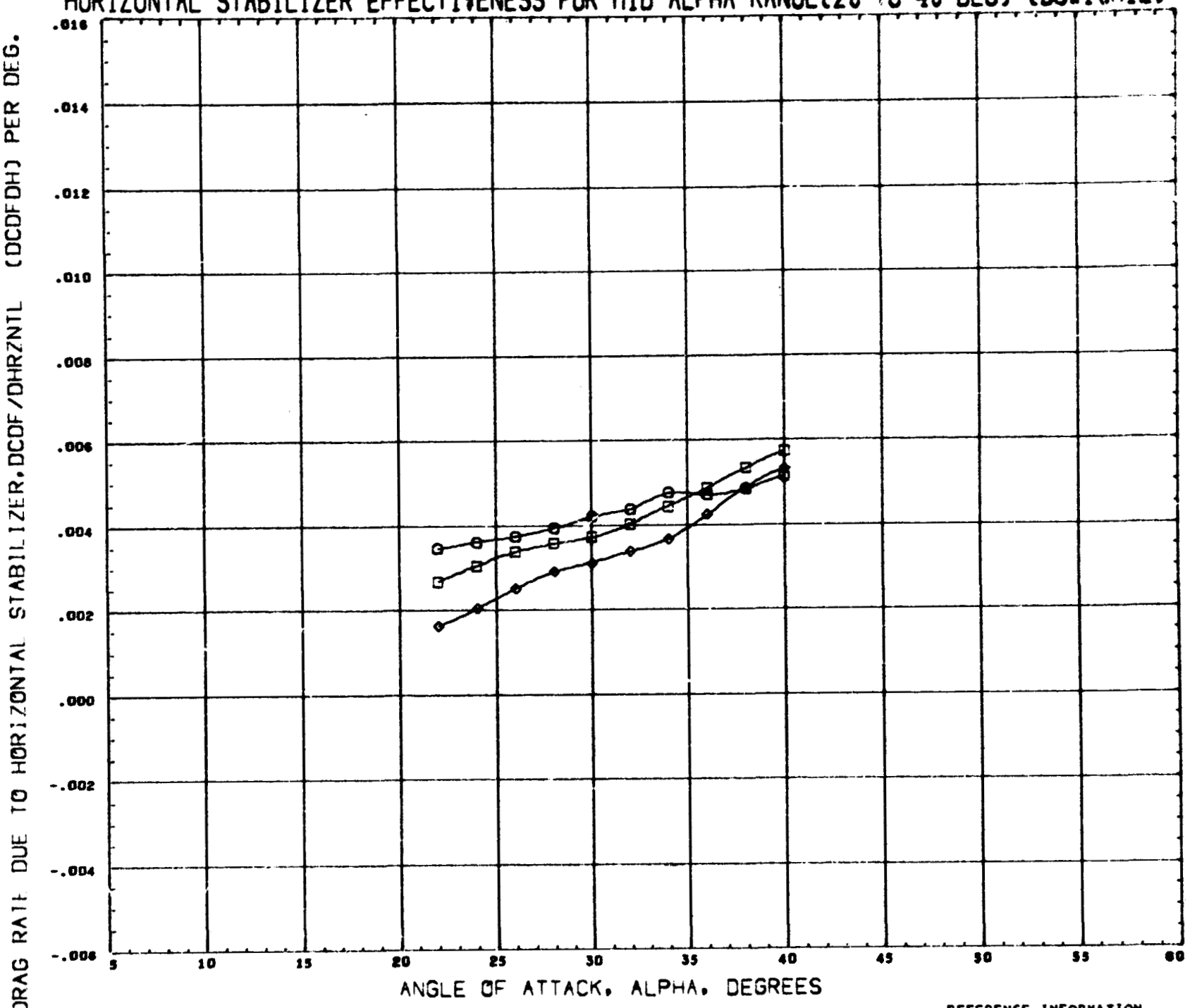
SYMBOL	MACH		PARAMETRIC VALUES		
○	2.000	BETA	0.020	HRZNTL	- 20.000
□	3.000				
◇	5.000				

REFERENCE FILE

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (BGW10H12)

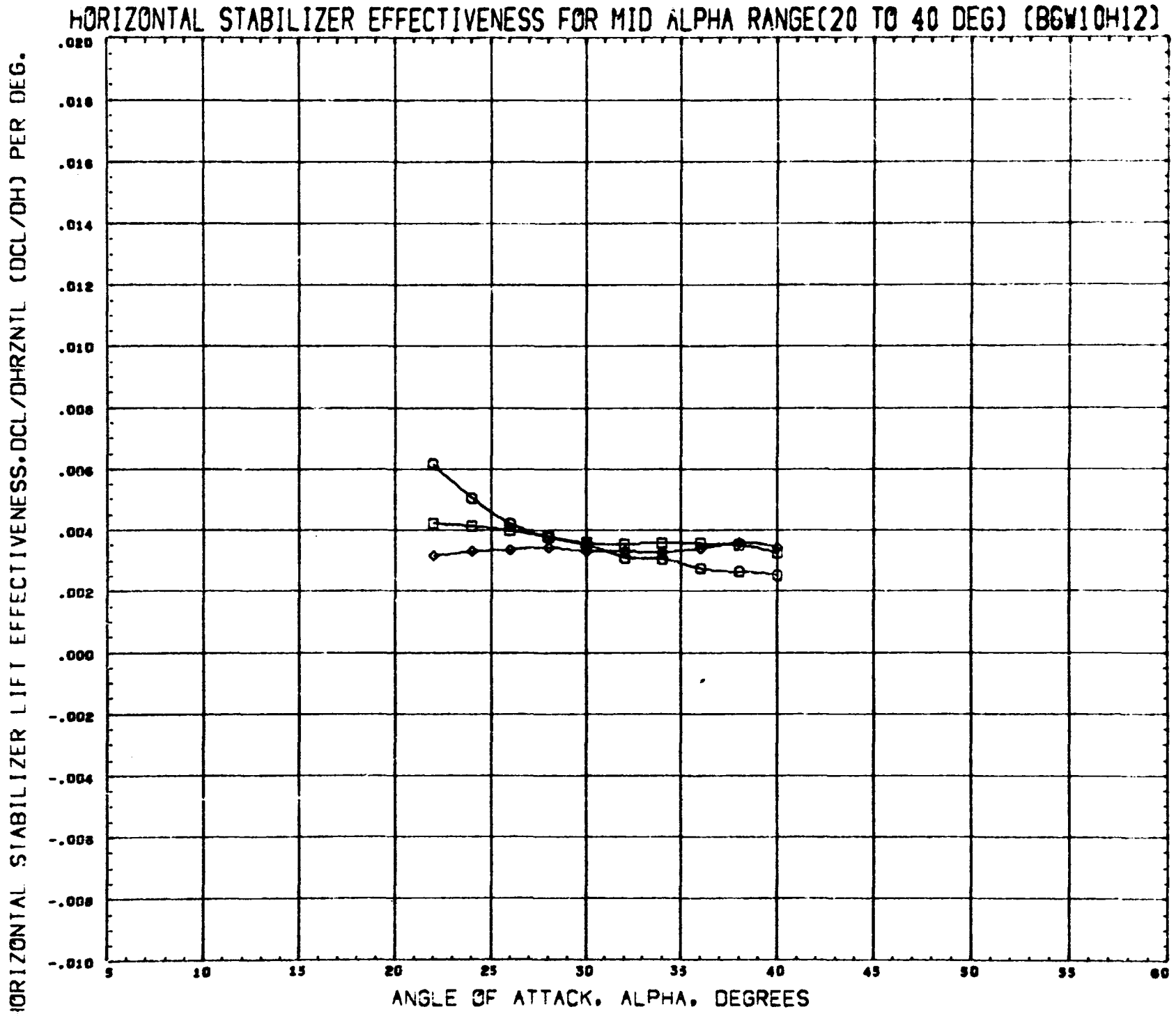


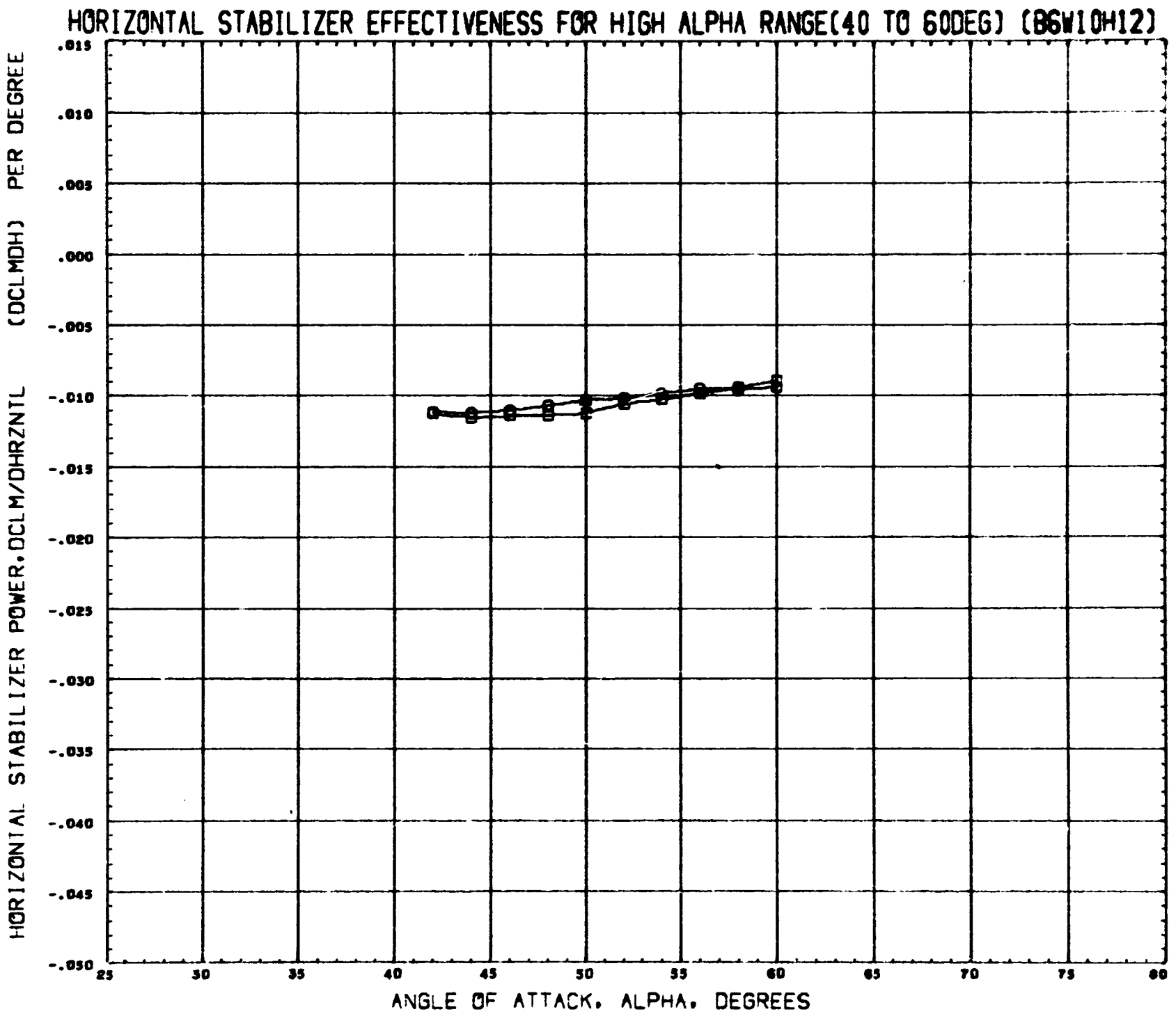
SYMBOL	MACH		PARAMETRIC VALUES		
○	2.000	BETA	0.020	HRZNTL	- 20.000
□	3.000				
◇	5.000				

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE


HORIZONTAL STABILIZER EFFECTIVENESS FOR MID ALPHA RANGE(20 TO 40 DEG) (BGW10H12)
HORIZONTAL STABILIZER LIFT EFFECTIVENESS,DCL/DHRZNTL (DCL/DH) PER DEG.
.020
.018
.016
.014
.012
.010
.008
.006
.004
.002
.000
-.002
-.004
-.006
-.008
-.010
5
10
15
20
25
30
35
40
45
50
55
60
ANGLE OF ATTACK, ALPHA, DEGREES
SYMBOL MACH
2.000
3.000
5.000
PARAMETRIC VALUES
BETA 0.020 HRZNTL - 20.000
REFERENCE INFORMATION
REFS 5.4400 SQINCH
REFL 1.1300 INCHES
REFB 5.2150 INCHES
XMRP 4.5260 INCHES
YMRP 0.0000 INCHES
ZMRP - 0.1780 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE



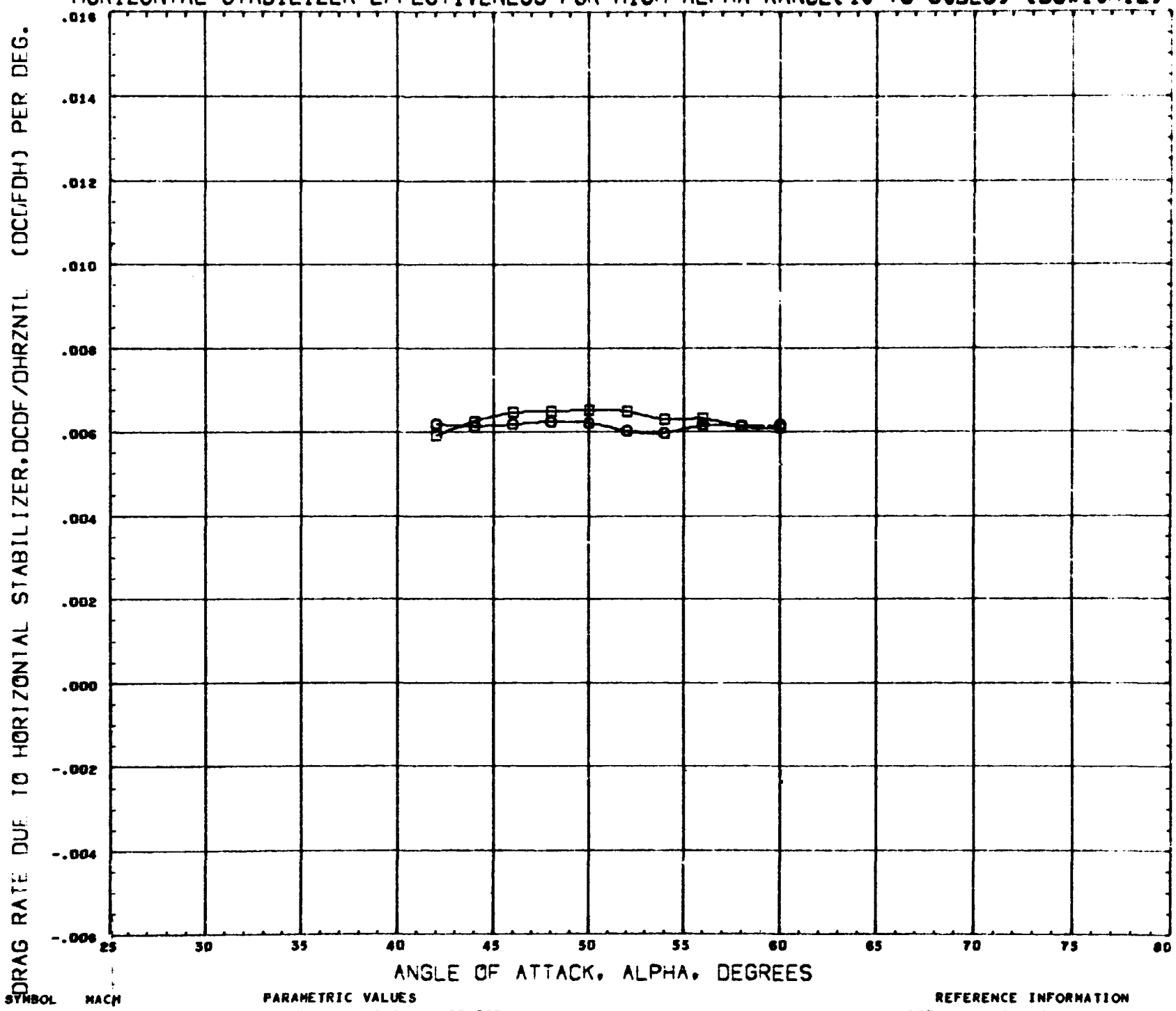
SYMBOL	MACH		PARAMETRIC VALUES		
○	3.000	BETA	0.000	HRZNTL	- 20.000
□	5.000				

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	- 0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE

HORIZONTAL STABILIZER EFFECTIVENESS FOR HIGH ALPHA RANGE(40 TO 60DEG) (B6W10H12)

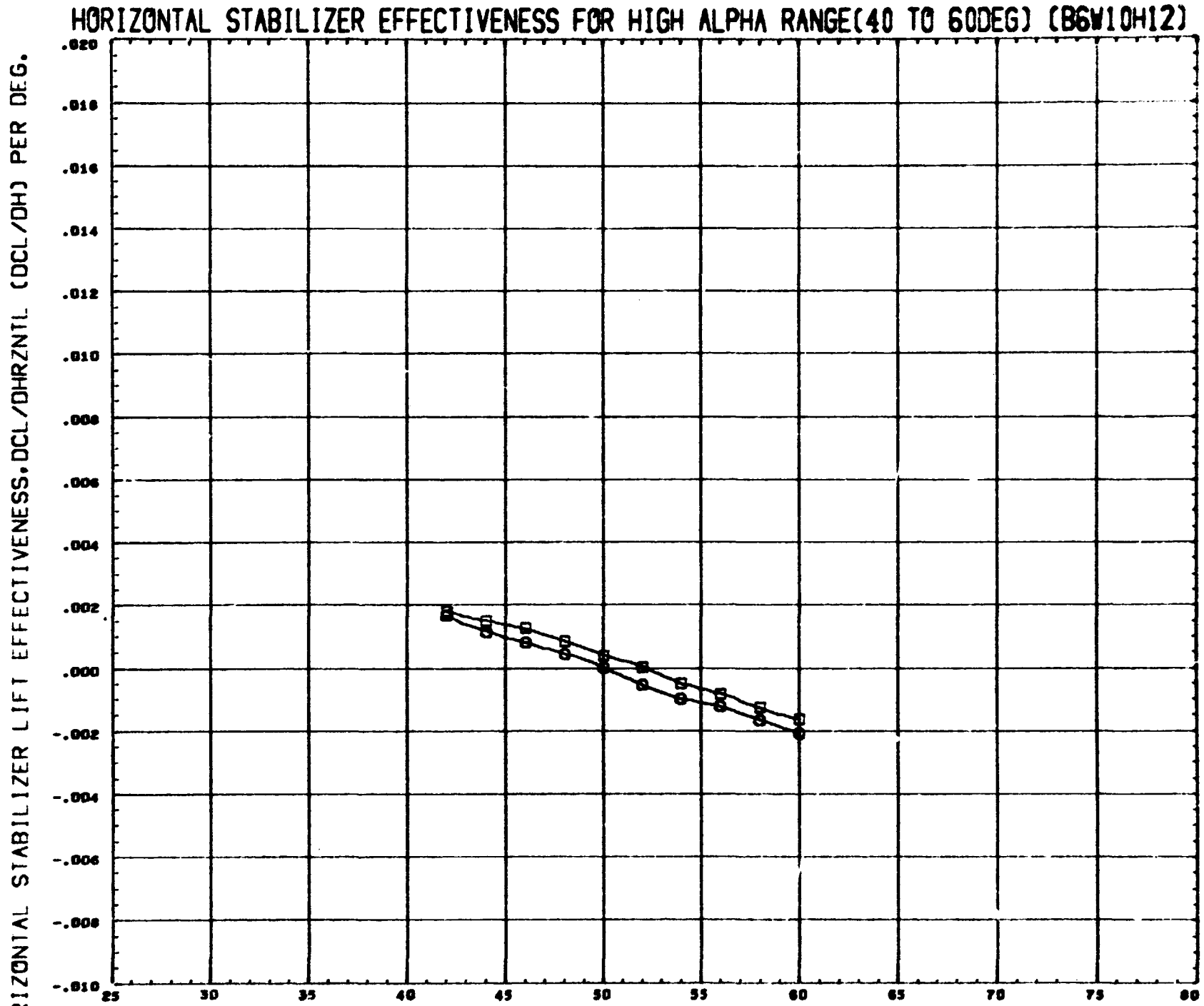


SYMBOL	MACH		PARAMETRIC VALUES		
□	3.000	BETA	0.000	HRZNTL	- 20.000
○	5.000				

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE



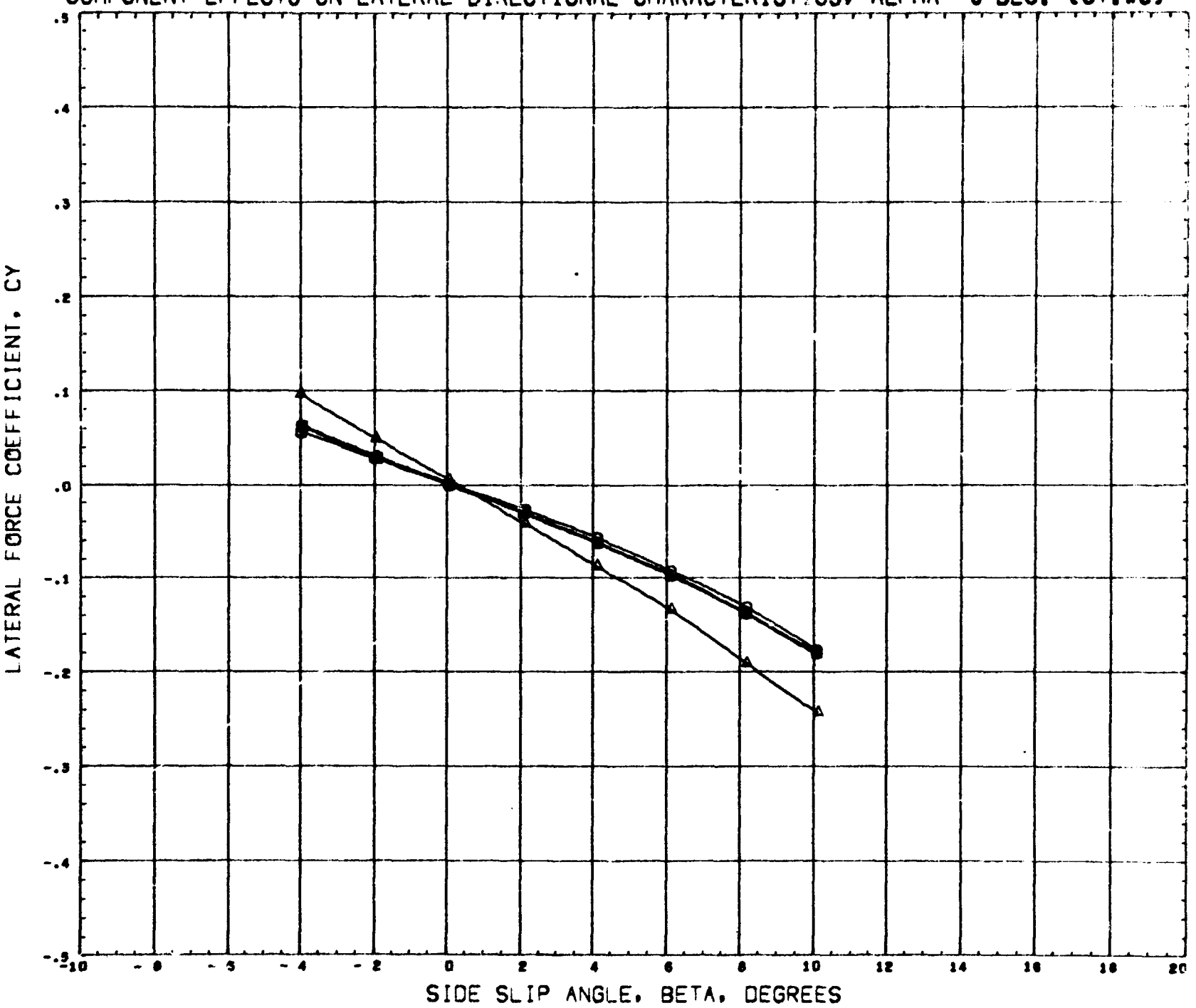
SYMBOL	MACH		PARAMETRIC VALUES		
□	3.000	BETA	0.000	HRZNTL	- 20.000
□	5.000				

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 0 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2117@)	○	MSFC468 NR ST ORBITER B6
(V2118@)	□	MSFC468 NR ST ORBITER B6W10
(V2119@)	◇	MSFC468 NR ST ORBITER B6W10H12
(V2120@)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 2.990

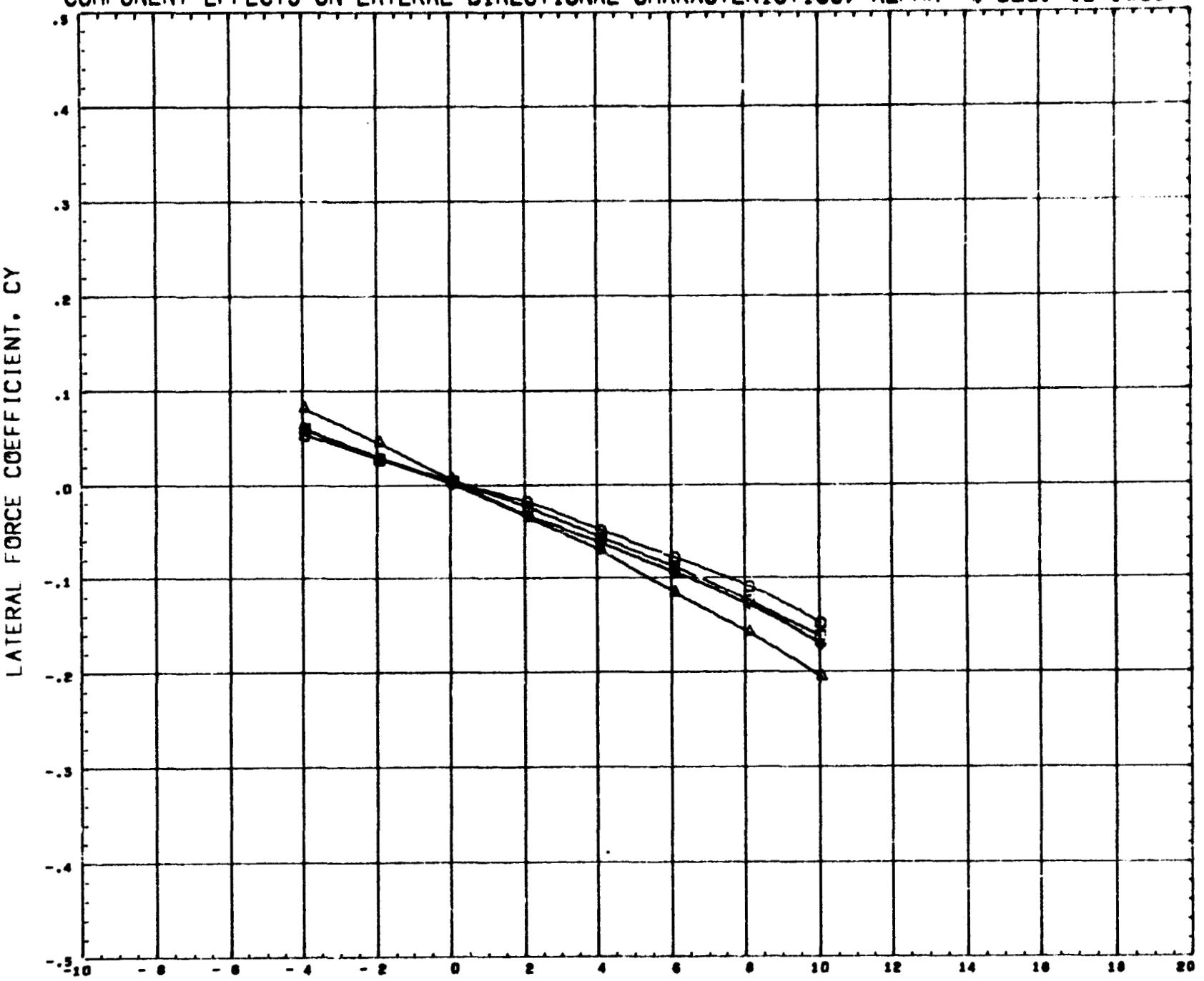
PARAMETRIC VALUES

ALPHA - 0.010

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 0 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V21170)	○	MSFC468 NR ST ORBITER B6
(V21180)	□	MSFC468 NR ST ORBITER B6W10
(V21190)	◇	MSFC468 NR ST ORBITER B6W10H12
(V21200)	△	MSFC468 NR ST ORBITER B6W10H12V5

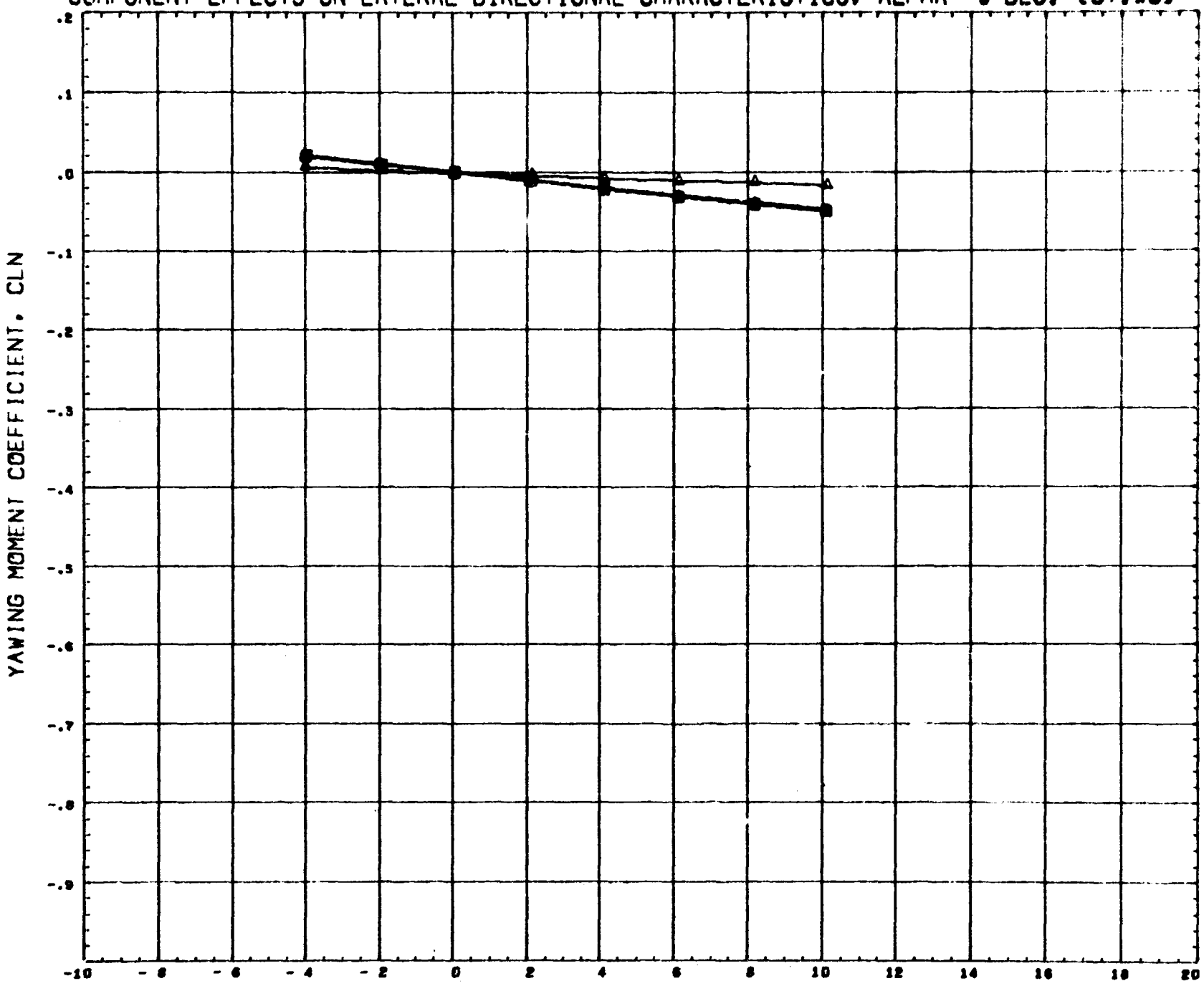
MACH 4.960

PARAMETRIC VALUES
ALPHA - 0.010

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 0 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2117@)	○	HSFC468 NR ST ORBITER B6
(V2118@)	□	HSFC468 NR ST ORBITER B6W10
(V2119@)	◇	HSFC468 NR ST ORBITER B6W10H12
(V2120@)	△	HSFC468 NR ST ORBITER B6W10H12V5

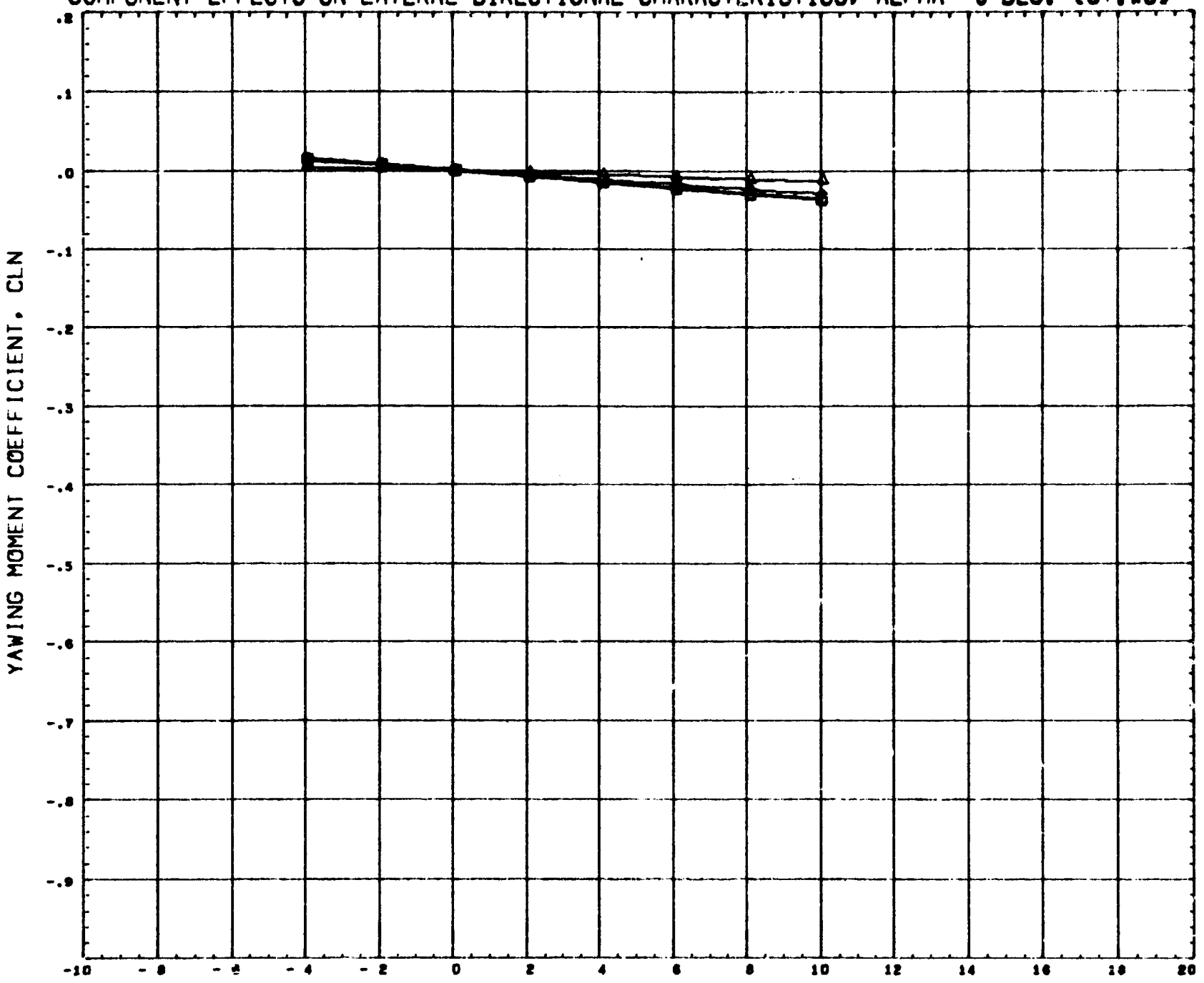
PARAMETRIC VALUES
ALPHA - 0.010

MACH 2.990

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.219	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 0 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V21170)	○	MSFC468 NR ST ORBITER B6
(V21180)	□	MSFC468 NR ST ORBITER B6W10
(V21190)	◇	MSFC468 NR ST ORBITER B6W10H12
(V21200)	△	MSFC468 NR ST ORBITER B6W10H12V5

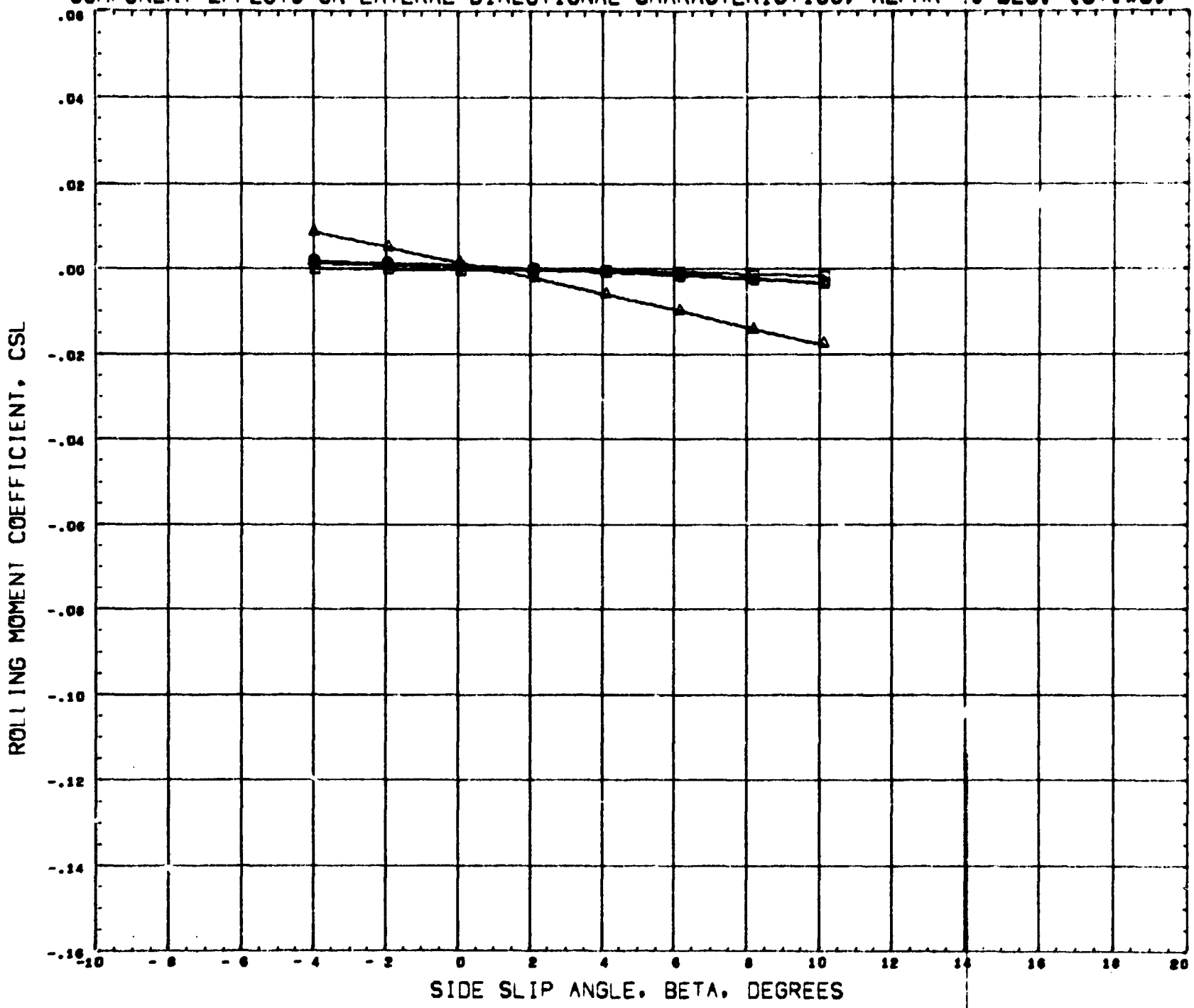
MACH 4.960

PARAMETRIC VALUES

ALPHA - 0.010

REFERENCE INFORMATION		
REFS	5.440	S@INCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= .0 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V21170)	○	MSFC468 NR ST ORBITER B6
(V21180)	□	MSFC468 NR ST ORBITER B6W10
(V21190)	◇	MSFC468 NR ST ORBITER B6W10H12
(V21200)	△	MSFC468 NR ST ORBITER B6W10H12V5

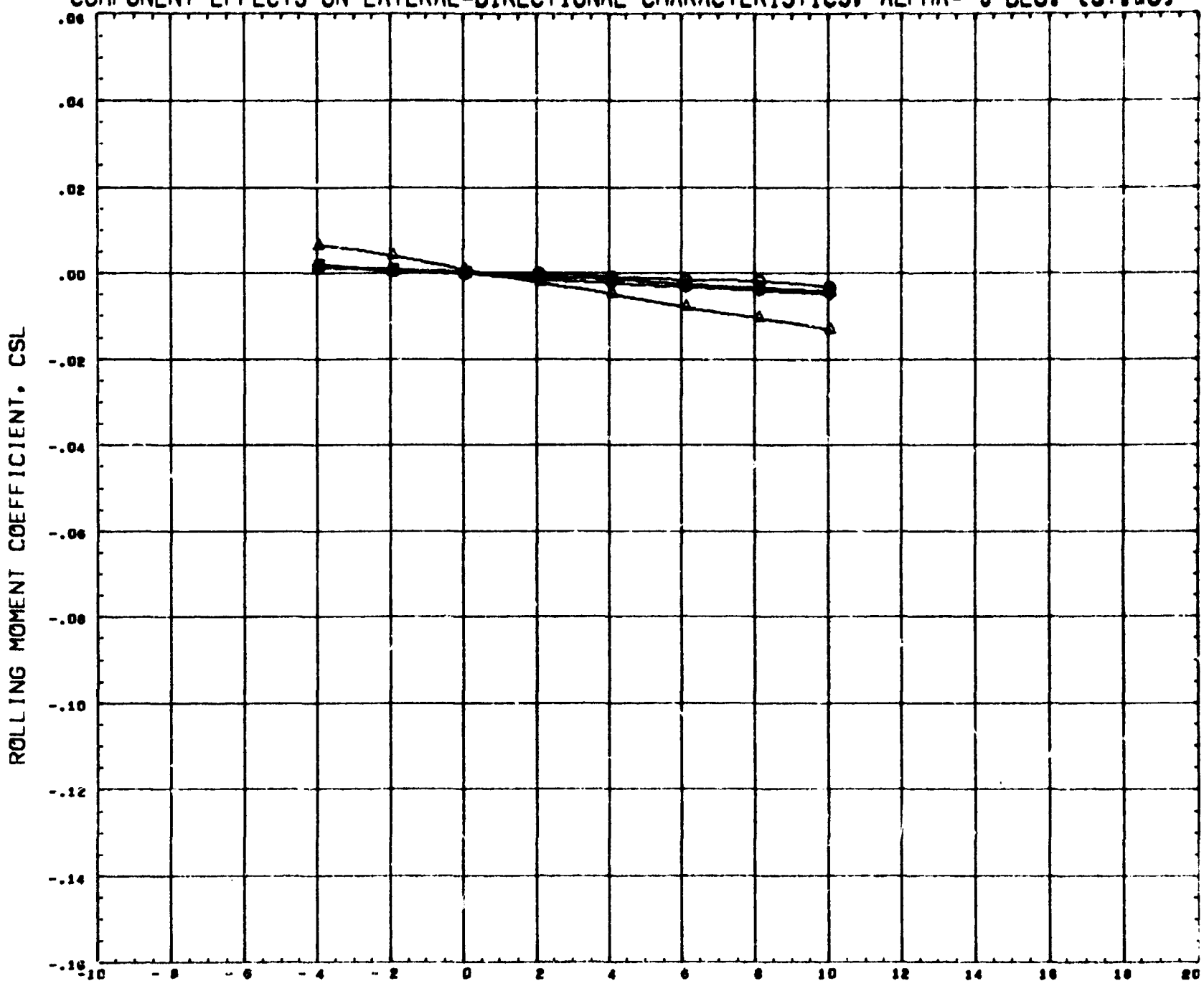
PARAMETRIC VALUES
ALPHA - 0.010

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

MACH 2.990

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 0 DEG. (ST.WB)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V21170)	○	MSFC468 NR ST ORBITER B6
(V21180)	□	MSFC468 NR ST ORBITER B6W10
(V21190)	◇	MSFC468 NR ST ORBITER B6W10H12
(V21200)	△	MSFC468 NR ST ORBITER B6W10H12V5

MACH 4.960

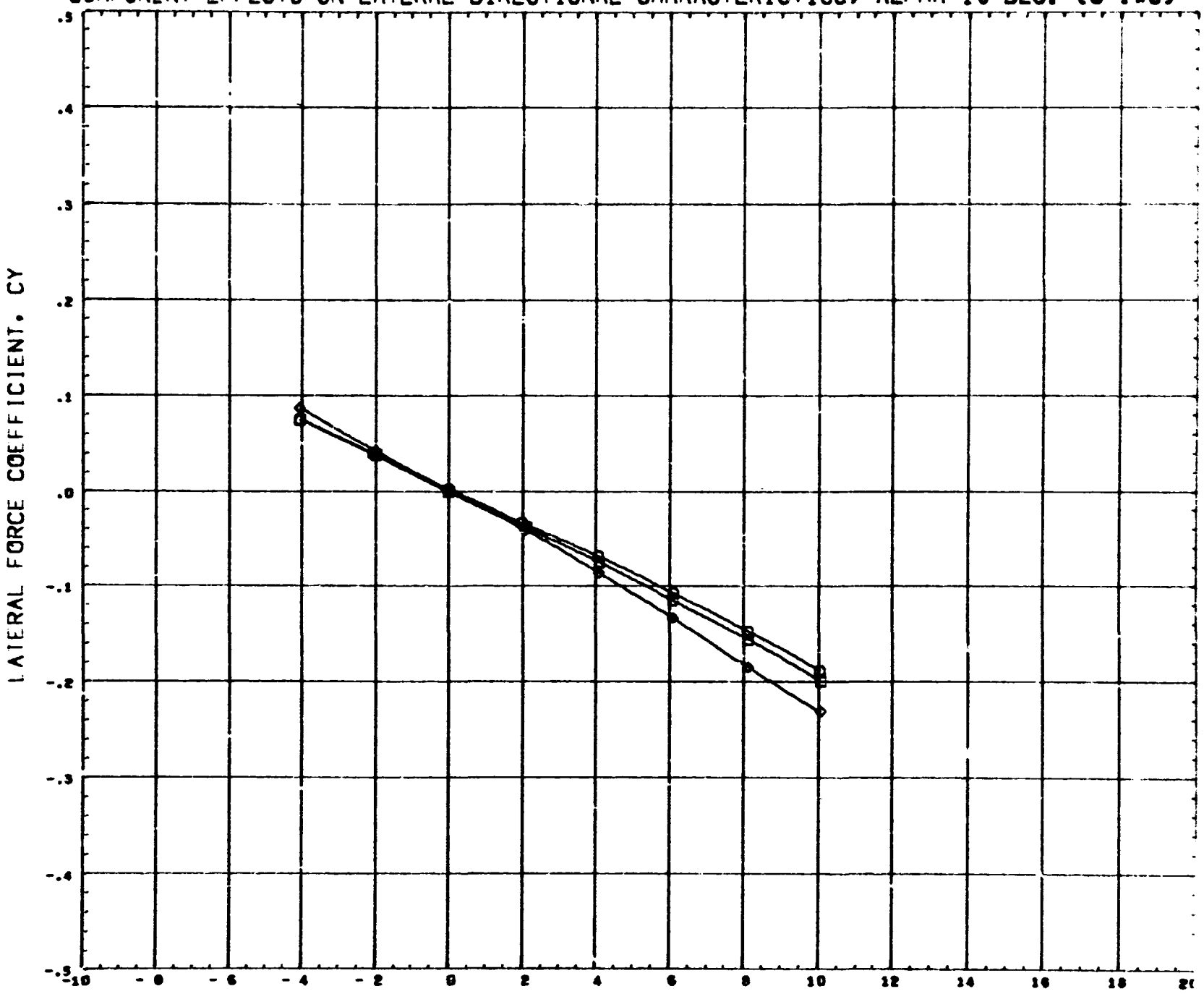
PARAMETRIC VALUES

ALPHA - 0.010

REFERENCE INFORMATION

REFS	2.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA=10 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2110R)	○	MSFC468 NR ST ORBITER B6W10
(V2119R)	□	MSFC468 NR ST ORBITER B6W10H12
(V2120R)	◇	MSFC468 NR ST ORBITER B6W10H12V5

PARAMETRIC VALUES

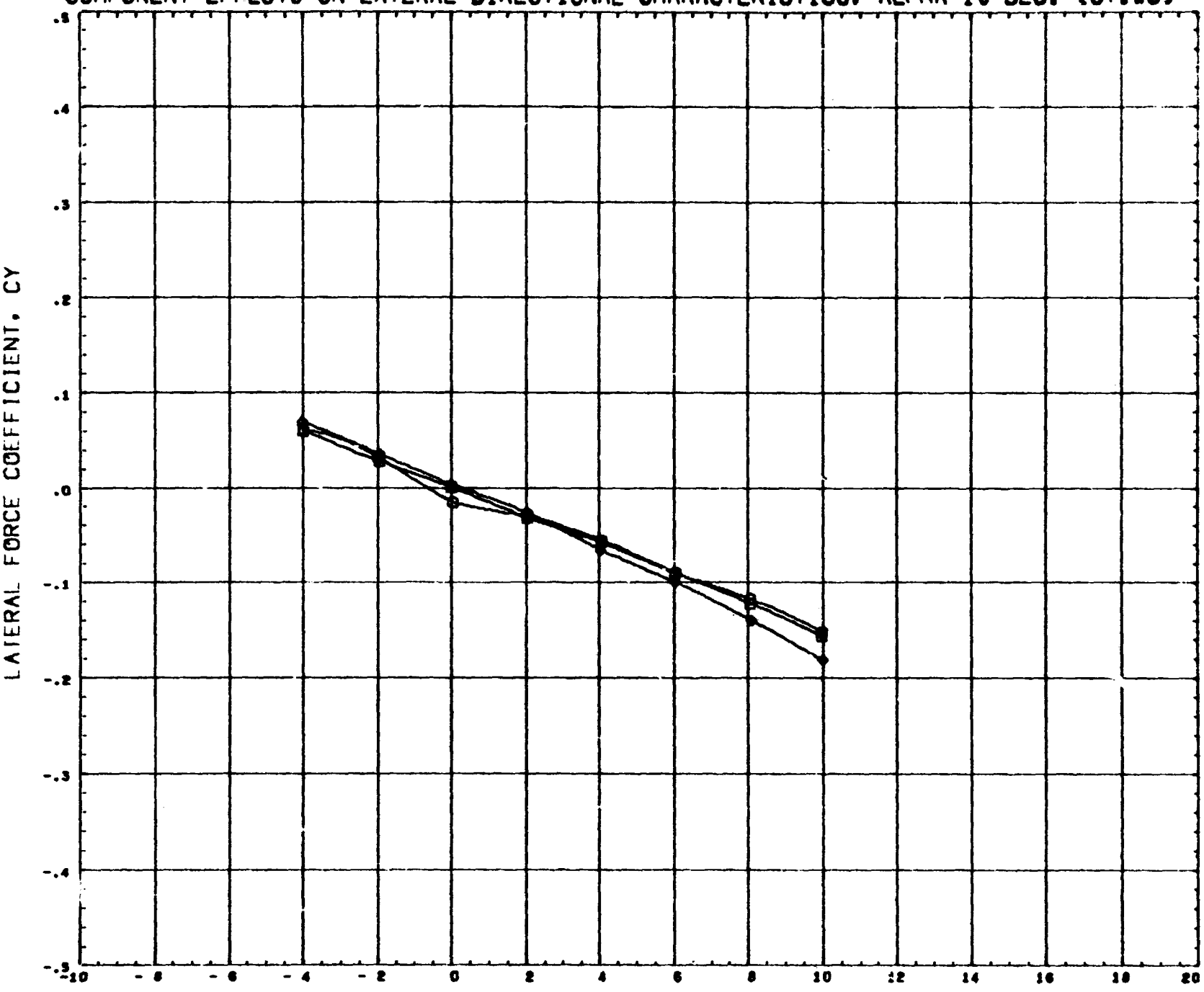
ALPHA 10.170

MACH 2.990

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.170	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA=10 DEG. (ST.WO)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2118R)	○	HSFC468 NR ST ORBITER B6W1O
(V2119R)	□	HSFC468 NR ST ORBITER B6W1OH12
(V2120R)	◇	HSFC468 NR ST ORBITER B6W1OH12V5

PARAMETRIC VALUES

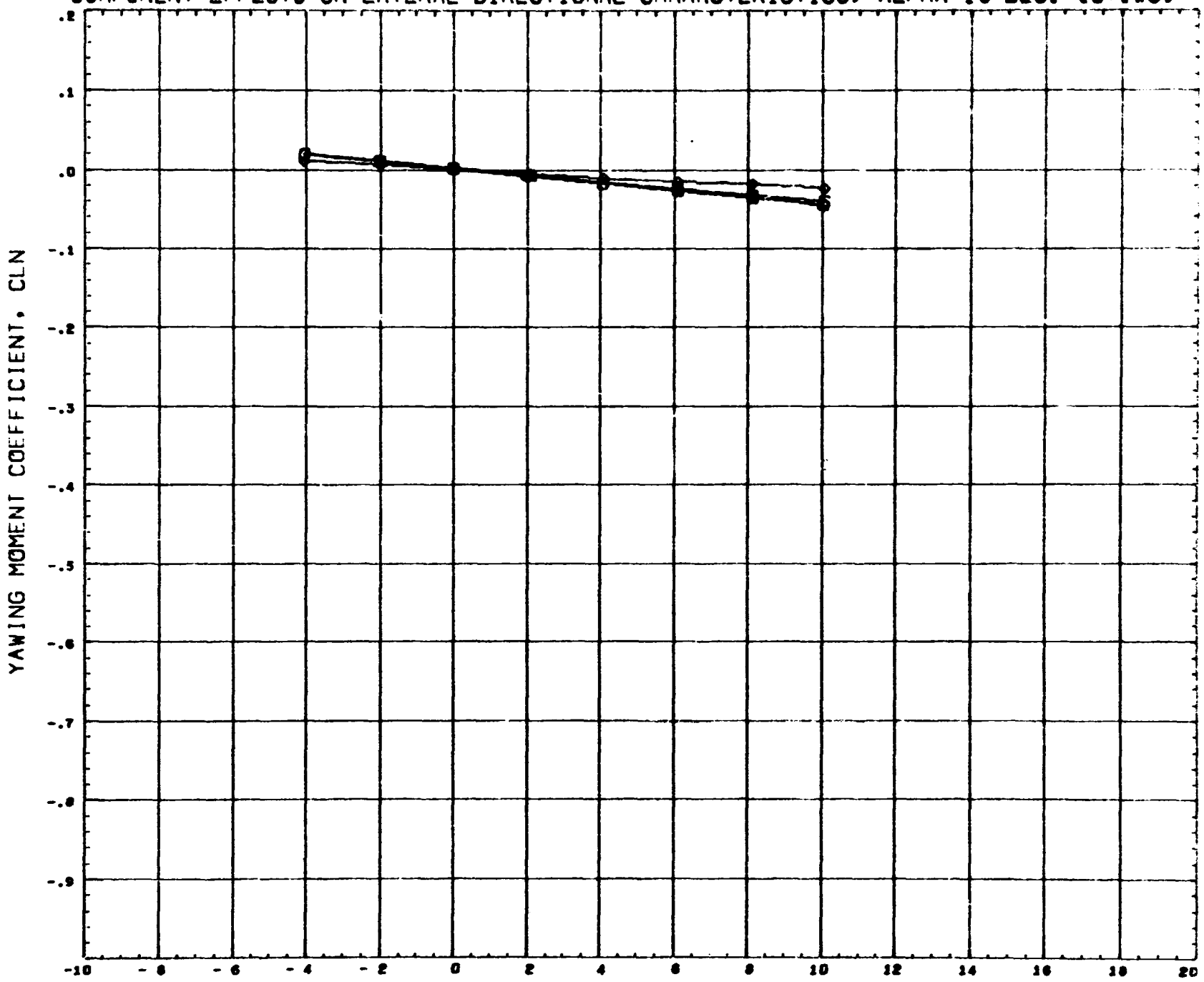
ALPHA 1O.17O

MACH 4.96O

REFERENCE INFORMATION

REFS	5.44O	SQINCH
REFL	1.13O	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	O.OOO	INCHES
ZMRP	- O.17O	INCHES
SCALE	O.OO3	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA=10 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2118R)	○	MSFC468 NR ST ORBITER B6W10
(V2119R)	□	MSFC468 NR ST ORBITER B6W10H12
(V2120R)	◇	MSFC468 NR ST ORBITER B6W10H12V5

MACH 2.990

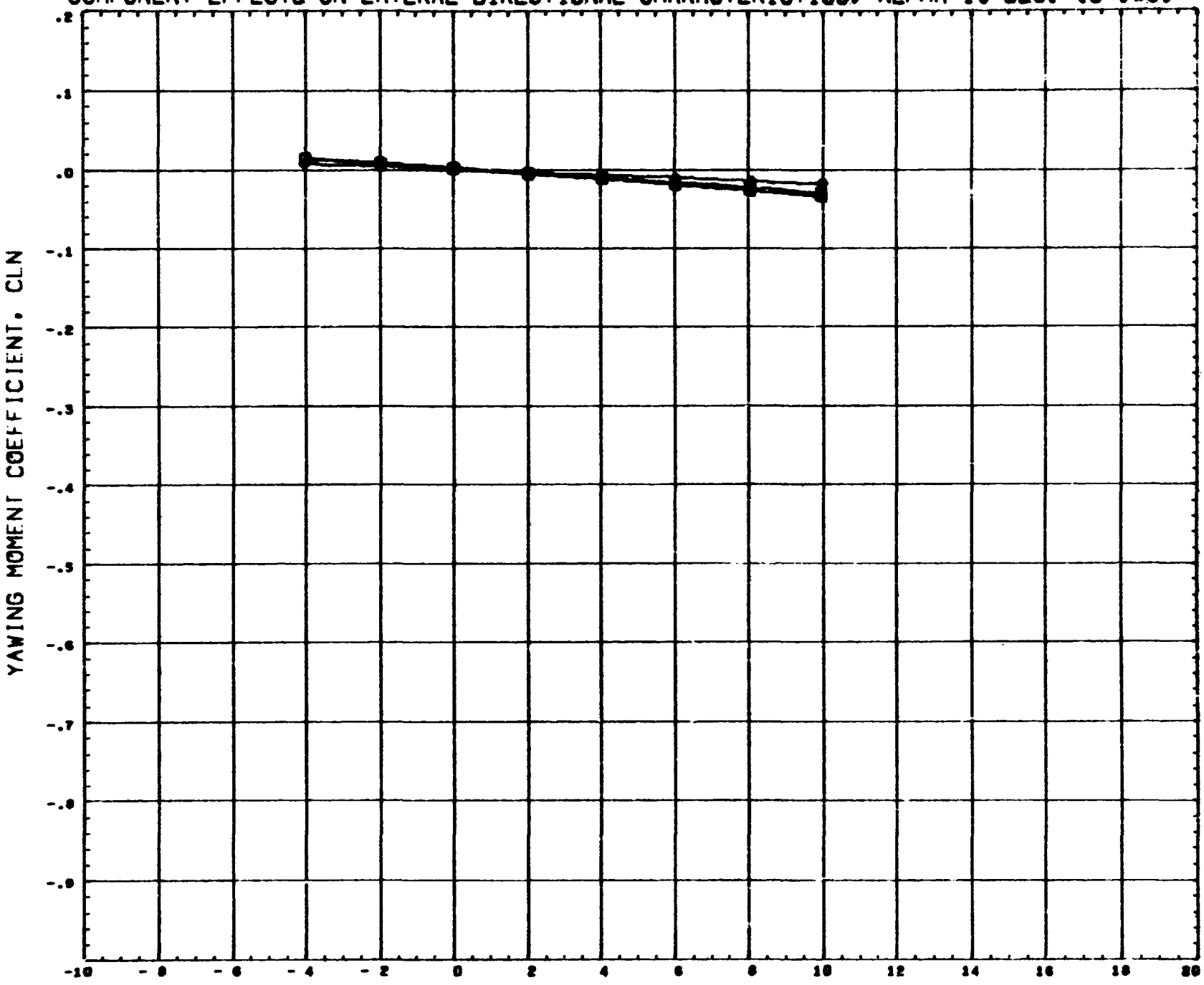
PARAMETRIC VALUES

ALPHA 10. .70

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA=10 DEG. (ST.WO)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2118R)	○	NSFC468 NR ST ORBITER B6W1D
(V2119R)	□	NSFC468 NR ST ORBITER B6W1DH12
(V2120R)	◇	NSFC468 NR ST ORBITER B6W1DH12V5

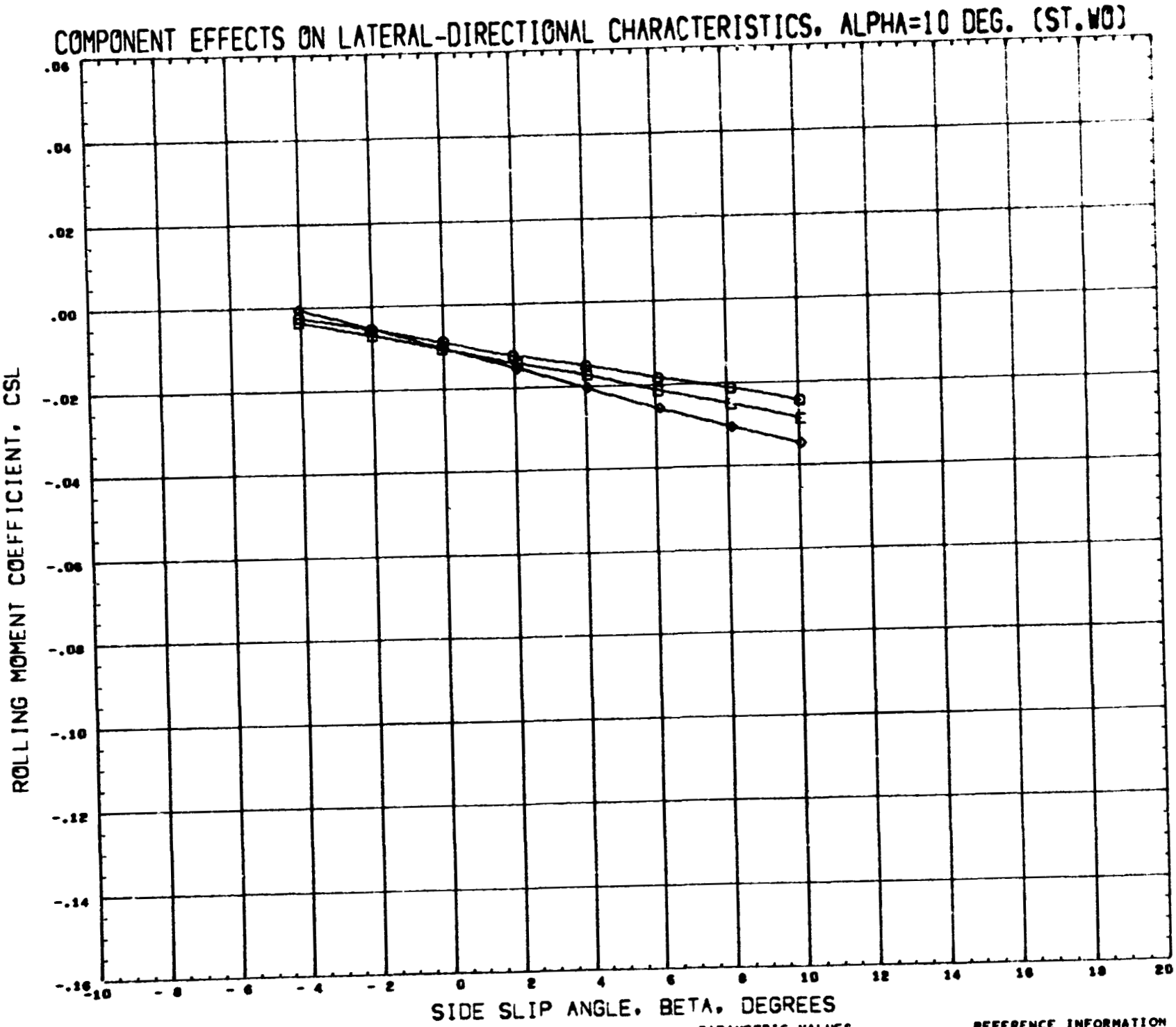
MACH 4.960

PARAMETRIC VALUES

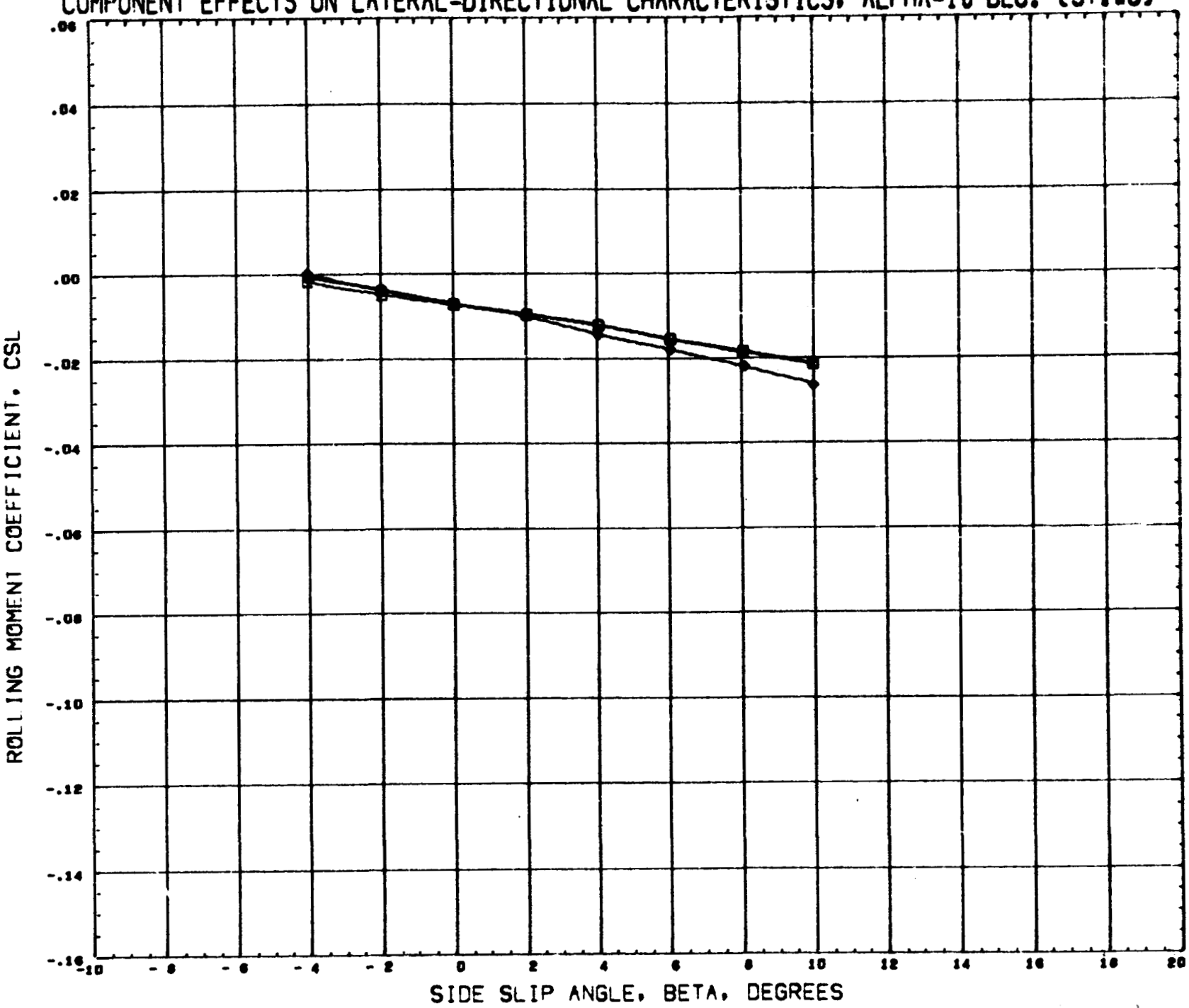
ALPHA 10.170

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	-0.178	INCHES
SCALE	0.803	SCALE


COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA=10 DEG. (ST.WO)
ROLLING MOMENT COEFFICIENT, CSL
.06
.04
.02
.00
-.02
-.04
-.06
-.08
-.10
-.12
-.14
-.16
-10
-8
-6
-4
-2
0
2
4
6
8
10
12
14
16
18
20
SIDE SLIP ANGLE, BETA, DEGREES
DATA SET SYMBOL CONFIGURATION DESCRIPTION
(V2118R) MSFC468 NR ST ORBITER B6W10
(V2119R) MSFC468 NR ST ORBITER B6W10H12
(V2120R) MSFC468 NR ST ORBITER B6W10H12V5
PARAMETRIC VALUES
ALPHA 10.170
REFERENCE INFORMATION
REFS 5.440 SQINCH
REFL 1.130 INCHES
REFB 5.215 INCHES
XMRP 4.526 INCHES
YMRP 0.000 INCHES
ZMRP -0.178 INCHES
SCALE 0.003 SCALE
MACH 2.990

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA=10 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2118R)	○	MSFC468 NR ST ORBITER B6W10
(V2119R)	□	MSFC468 NR ST ORBITER B6W10H12
(V2120R)	◇	MSFC468 NR ST ORBITER B6W10H12V5

MACH 4.960

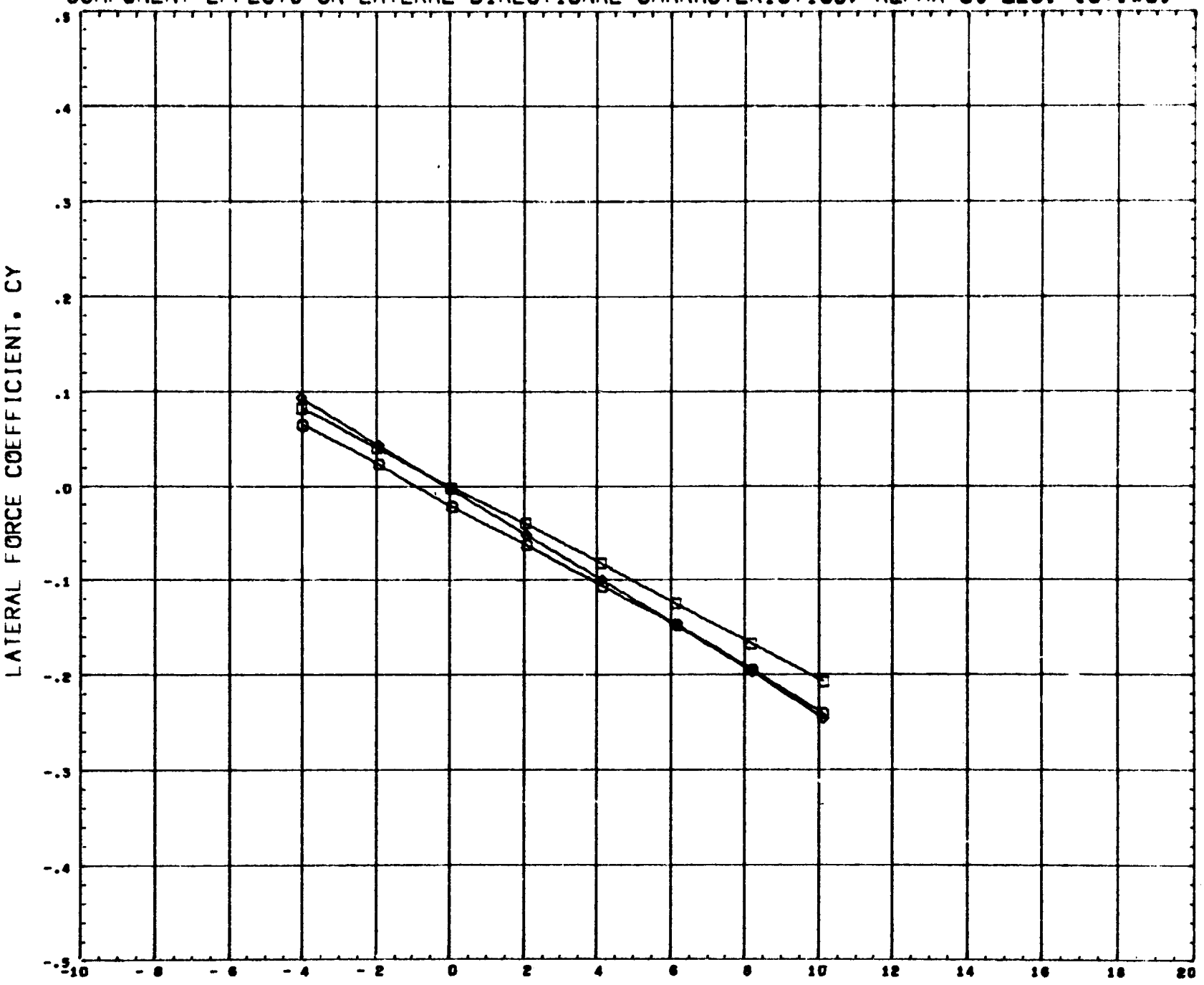
PARAMETRIC VALUES

ALPHA 10.170

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	-0.170	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA=60 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2117T)	○	MSFC468 NR ST ORBITER B6
(V2118T)	□	MSFC468 NR ST ORBITER B6W10
(V2119T)	◇	MSFC468 NR ST ORBITER B6W10H12

PARAMETRIC VALUES

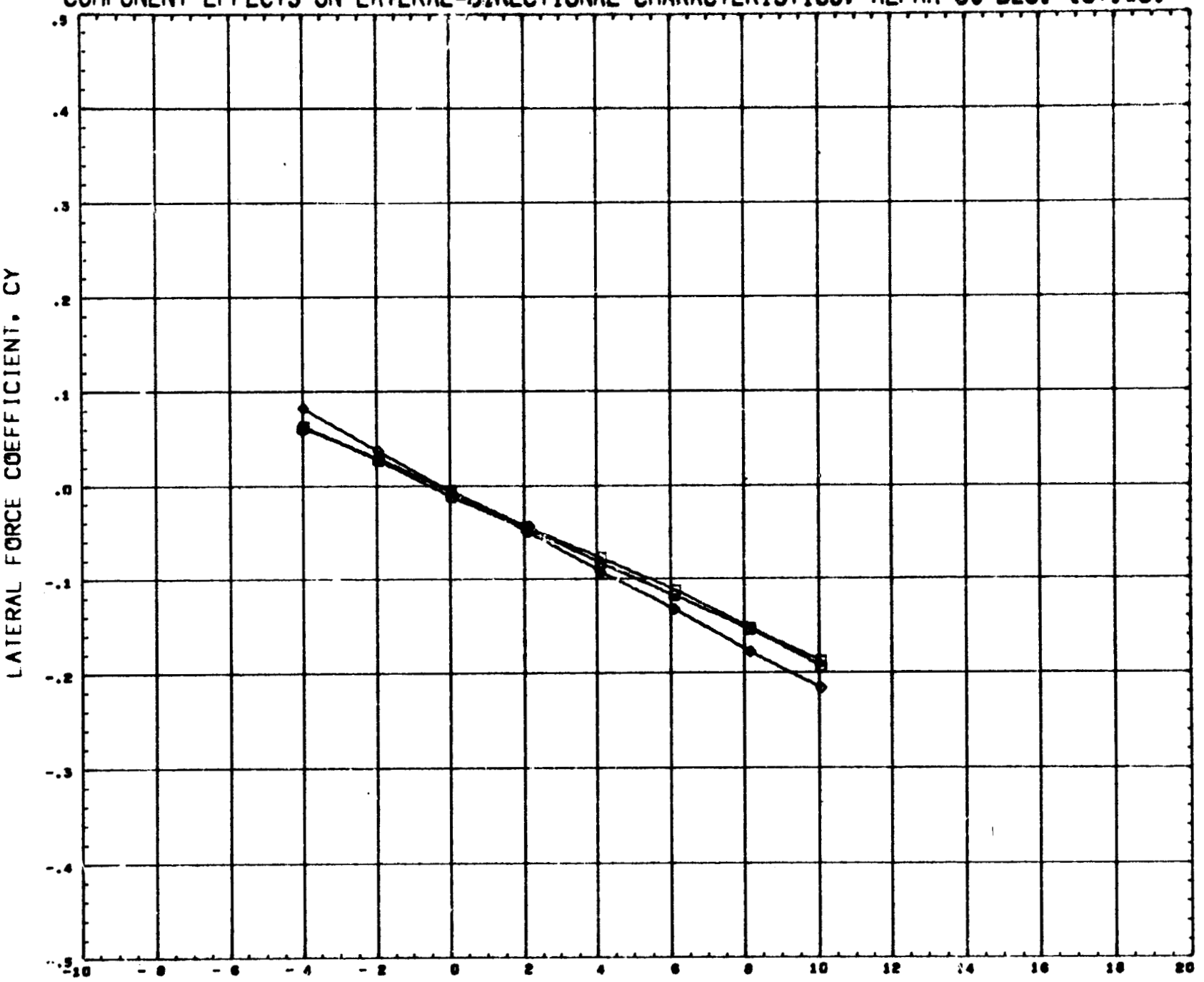
ALPHA 60.830

MACH 2.990

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA=60 DEG. (ST.WO)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(VZ117T)	○	NSFC468 NR ST ORBITER B6
(VZ118T)	□	NSFC468 NR ST ORBITER B6W10
(VZ119T)	◇	NSFC468 NR ST ORBITER B6W10H12

MACH 4.960

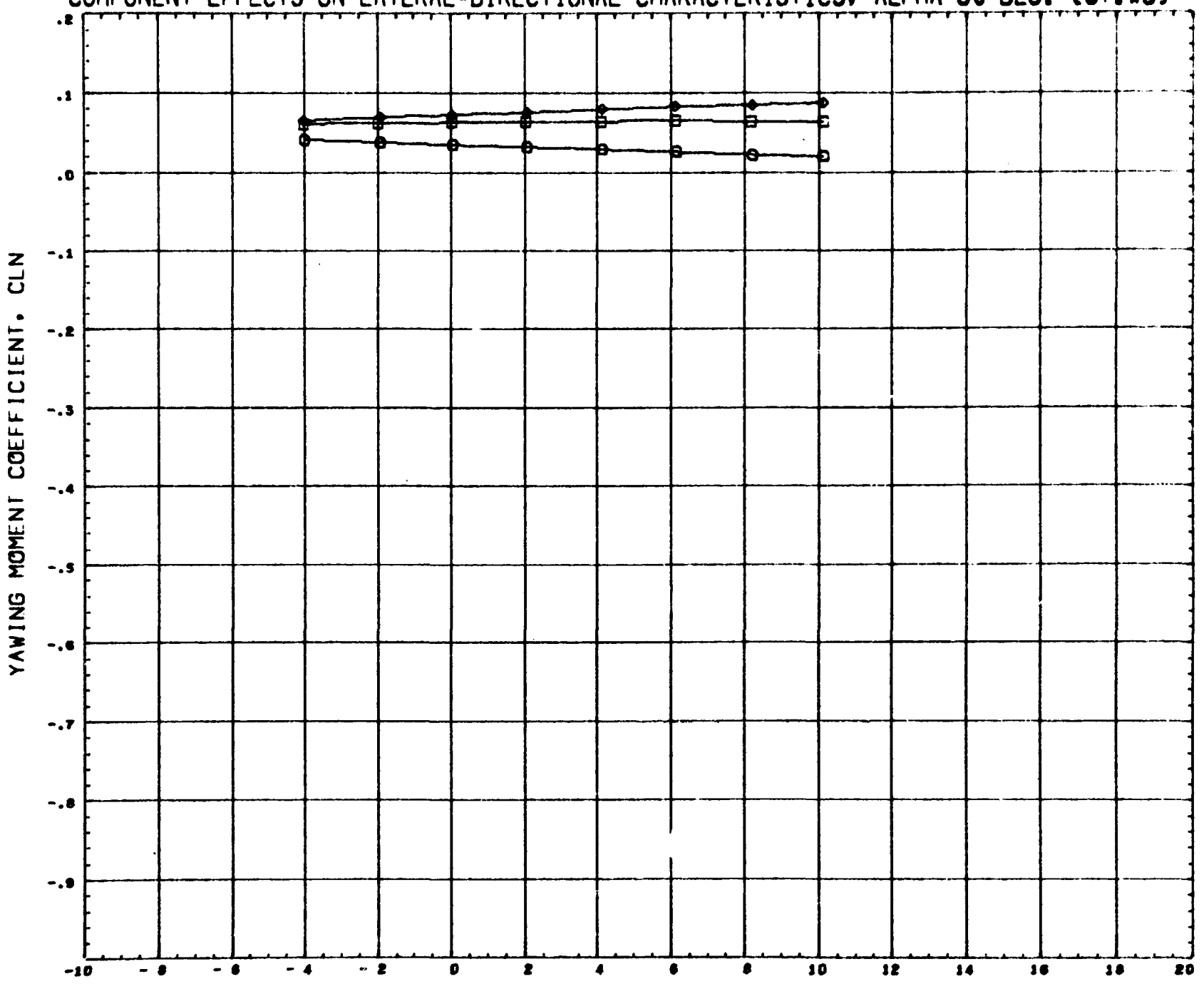
PARAMETRIC VALUES

ALPHA 60.830

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA=60 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2117T)	○	HSFC468 NR ST ORBITER B6
(V2118T)	□	HSFC468 NR ST ORBITER B6W10
(V2119T)	◇	HSFC468 NR ST ORBITER B6W10H12

PARAMETRIC VALUES

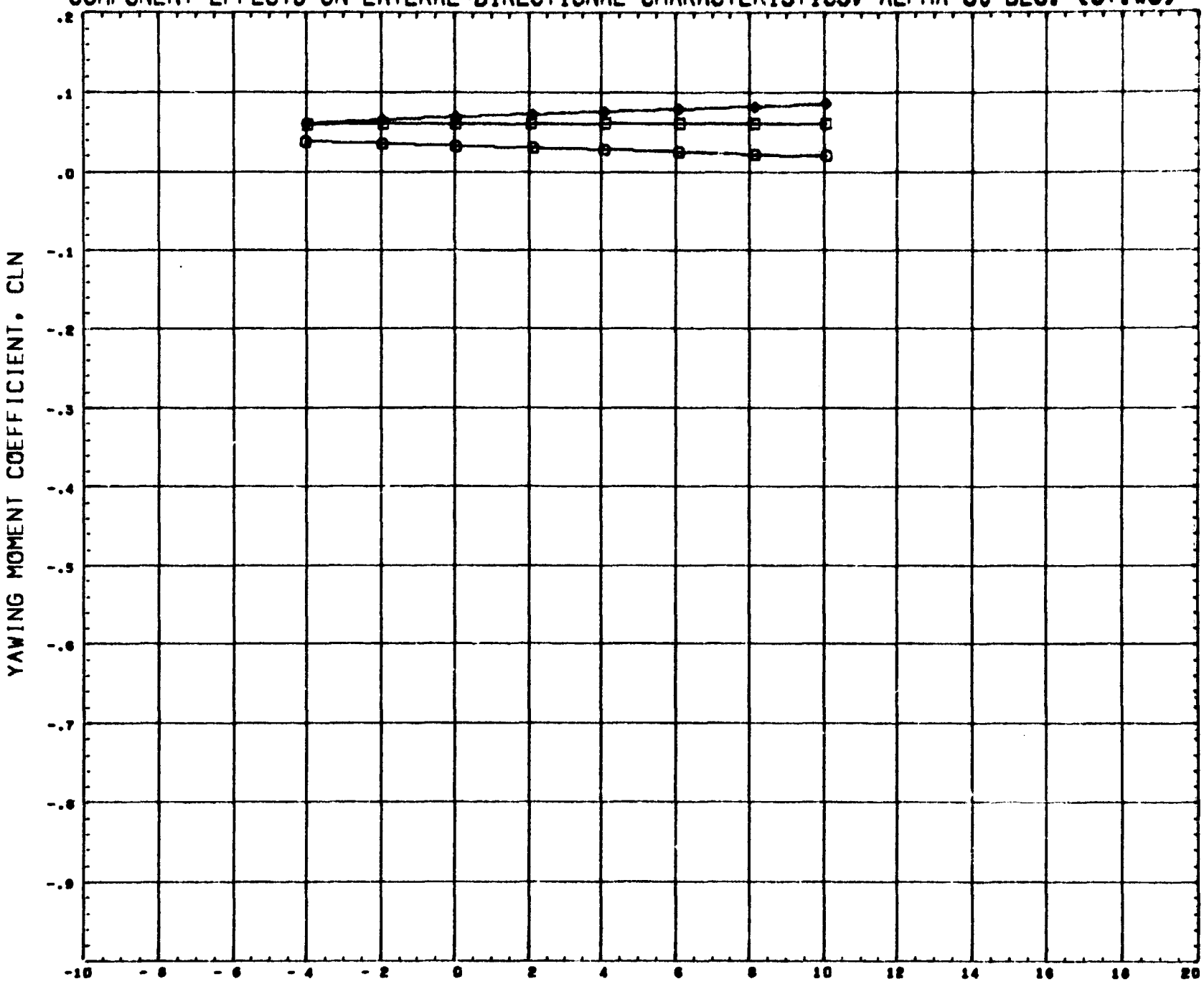
ALPHA 60.830

MACH 2.990

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.178	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA=60 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2117T)	○	MSFC468 NR ST ORBITER B6
(V2118T)	□	MSFC468 NR ST ORBITER B6W10
(V2119T)	◇	MSFC468 NR ST ORBITER B6W10H12

MACH 4.960

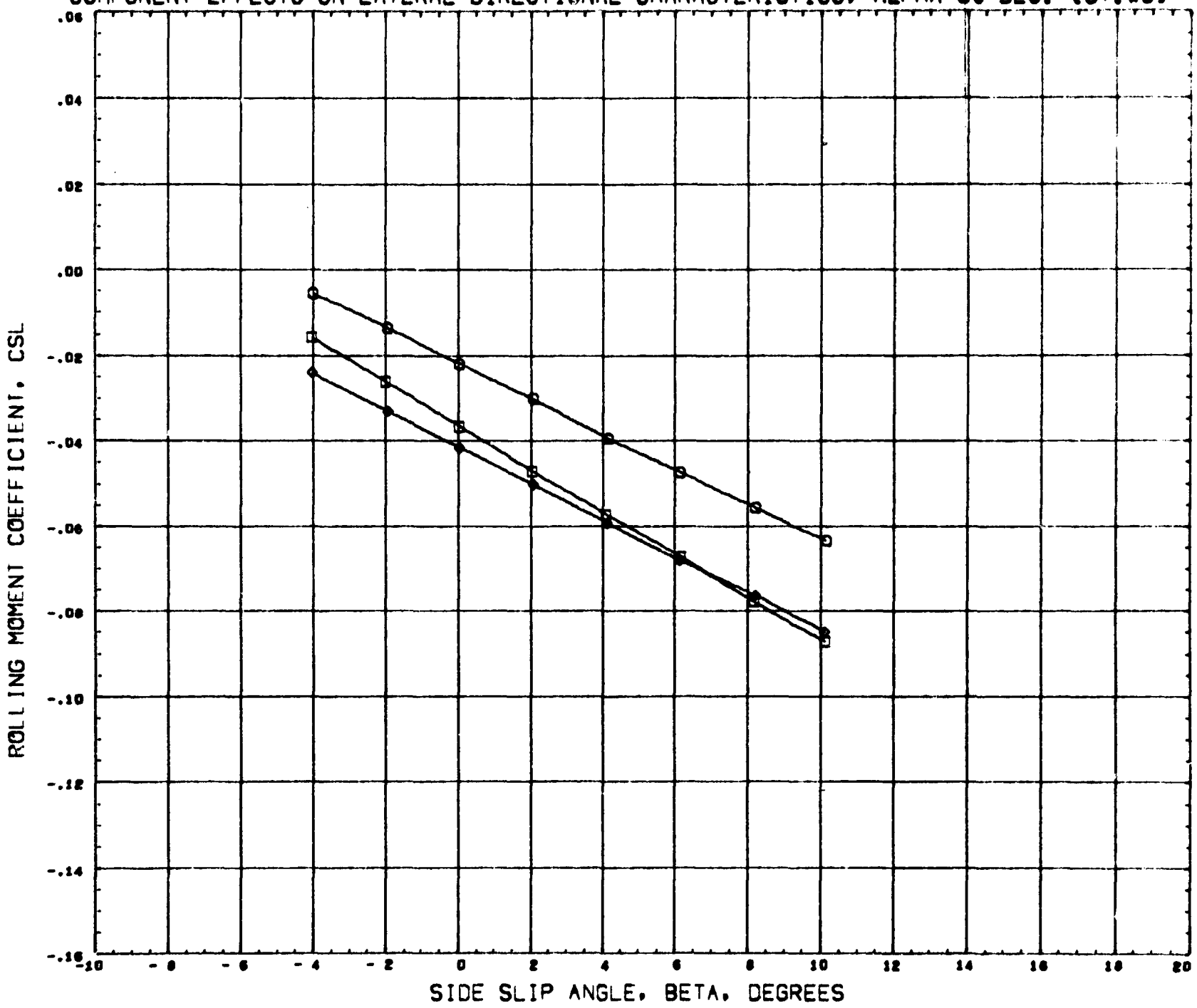
PARAMETRIC VALUES

ALPHA 60.850

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	-0.178	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA=60 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2117T)	○	MSFC468 NR ST ORBITER B6
(V2118T)	□	MSFC468 NR ST ORBITER B6W10
(V2119T)	◇	MSFC468 NR ST ORBITER B6W10H12

MACH 2.990

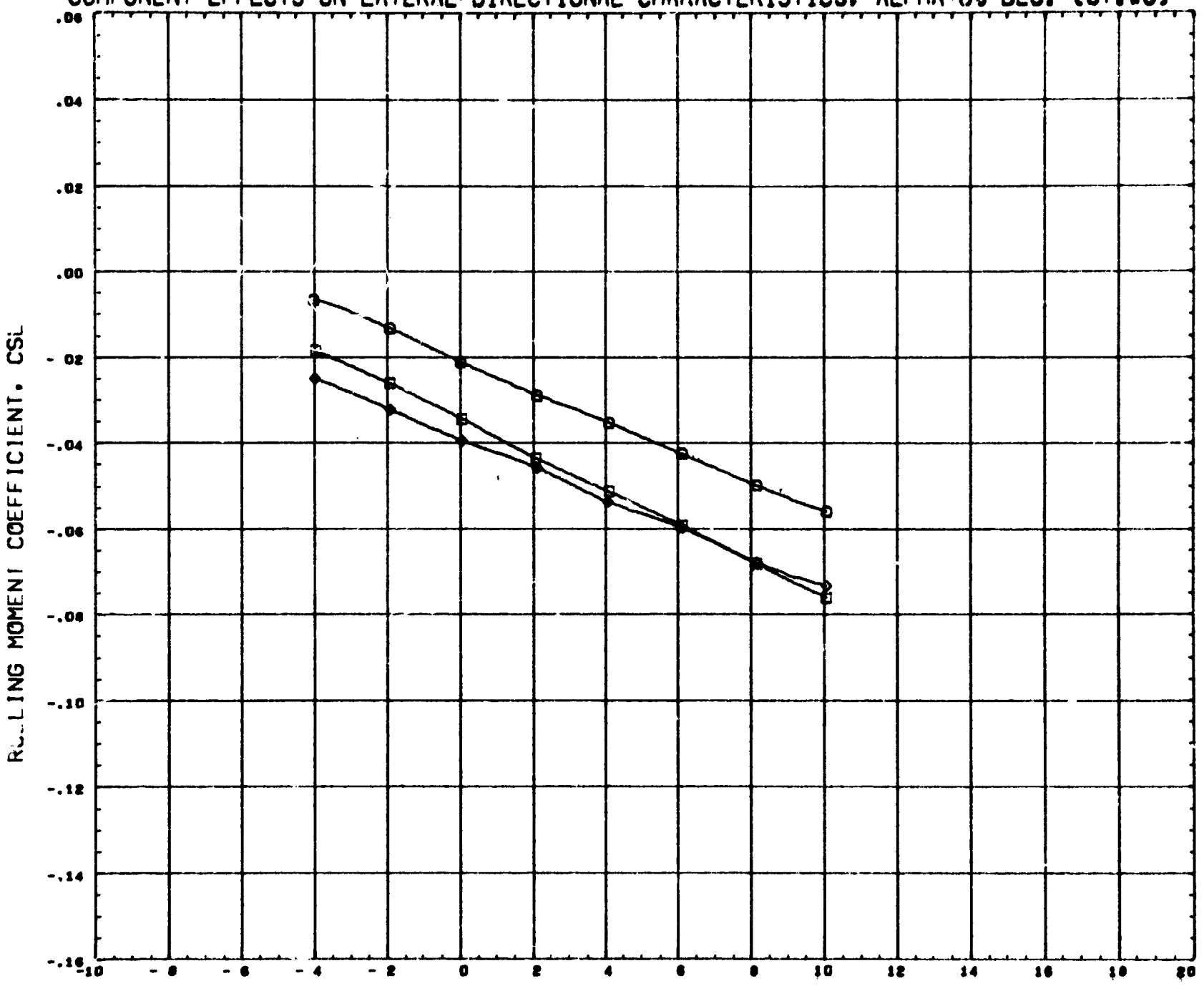
PARAMETRIC VALUES

ALPHA 60.830

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	9.215	INCHES
XMRP	4.526	INCHES
YMRP	0.000	INCHES
ZMRP	- 0.176	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA=60 DEG. (ST.W0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2117T)	○	MSFC468 NR ST ORBITER B6
(V2118T)	□	MSFC468 NR ST ORBITER B6W10
(V2119T)	◇	MSFC468 NR ST ORBITER B6W10H12

MACH 4.960

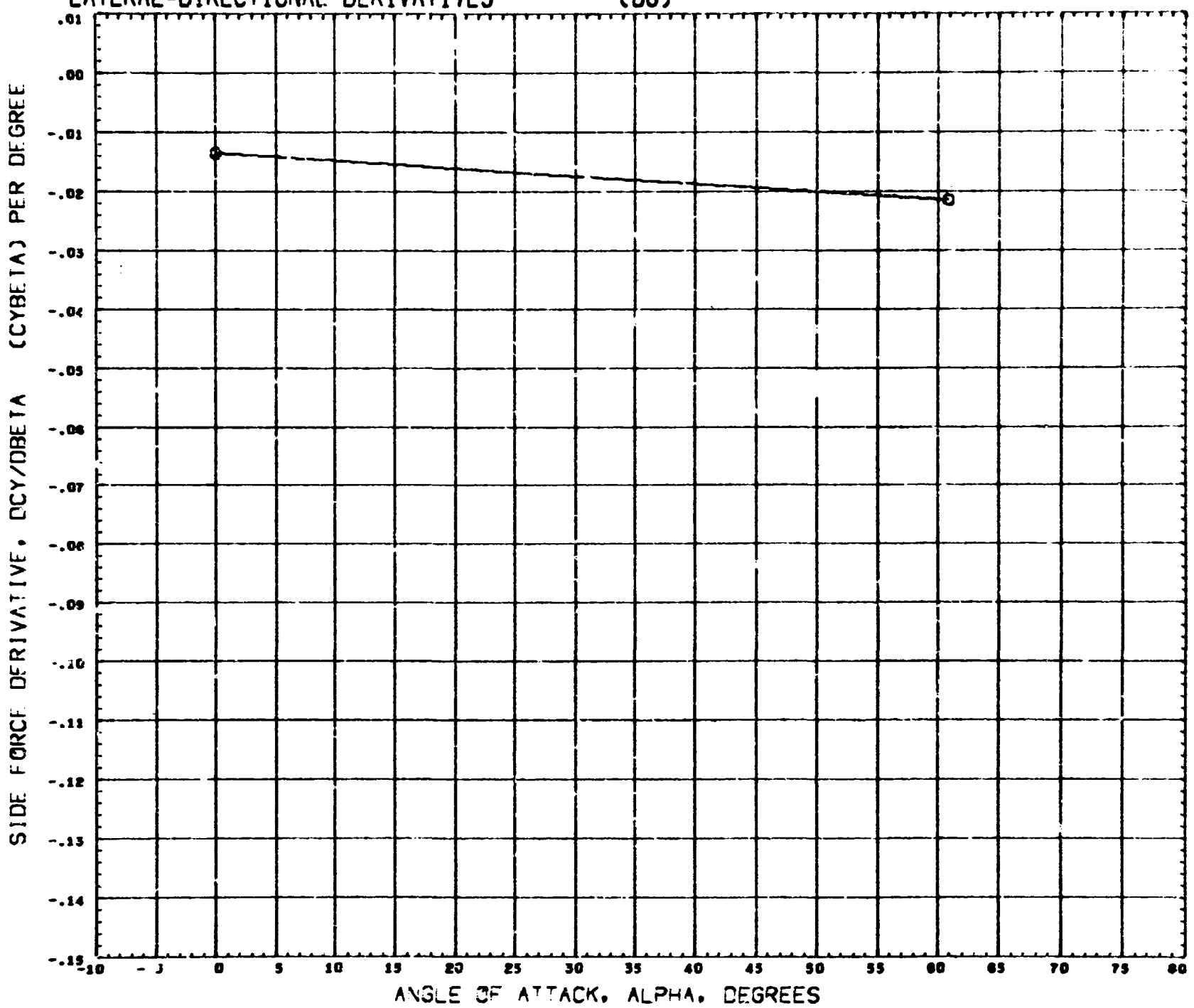
PARAMETRIC VALUES

ALPHA 60.030

REFERENCE INFORMATION

REFS	5.440	SQINCH
REFL	1.130	INCHES
REFB	5.215	INCHES
XMRP	4.926	INCHES
YMRP	0.000	INCHES
ZMRP	-0.178	INCHES
SCALE	0.003	SCALE

LATERAL-DIRECTIONAL DERIVATIVES (B6)



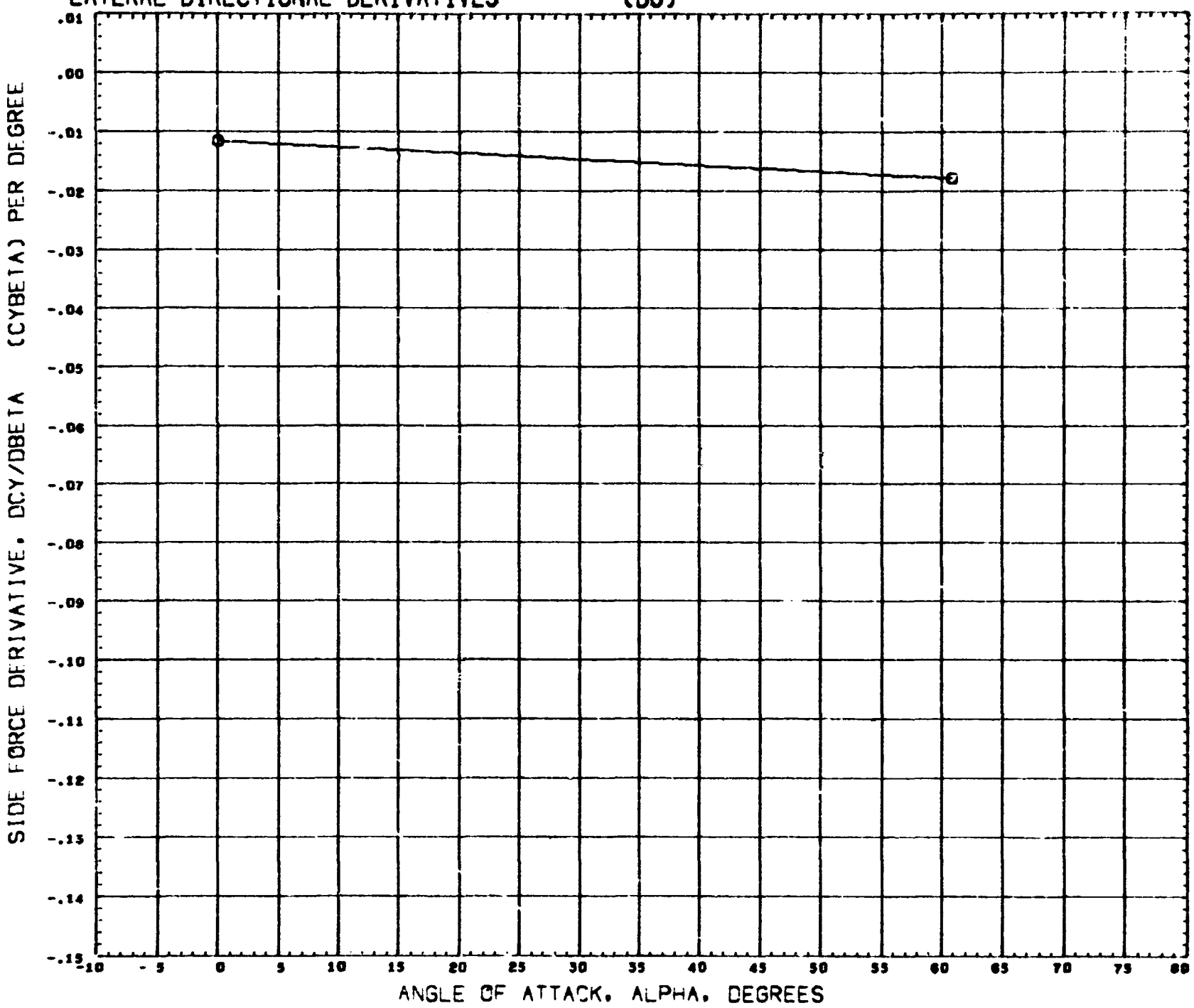
SYMBOL	MACH
O	3.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	-0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

LATERAL-DIRECTIONAL DERIVATIVES (B6)



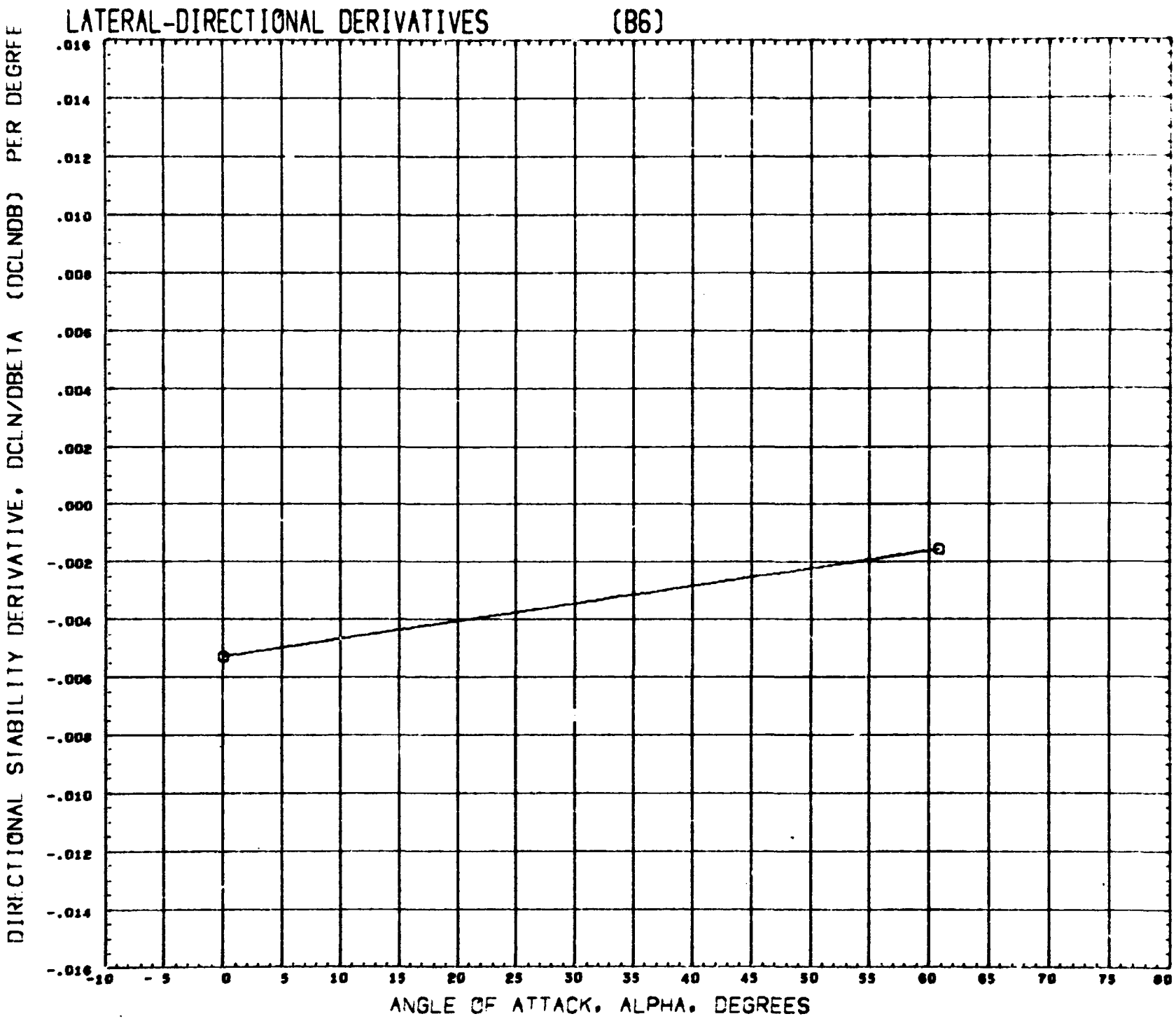
SYMBOL	MACH
O	5.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	9.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

LATERAL-DIRECTIONAL DERIVATIVES (B6)

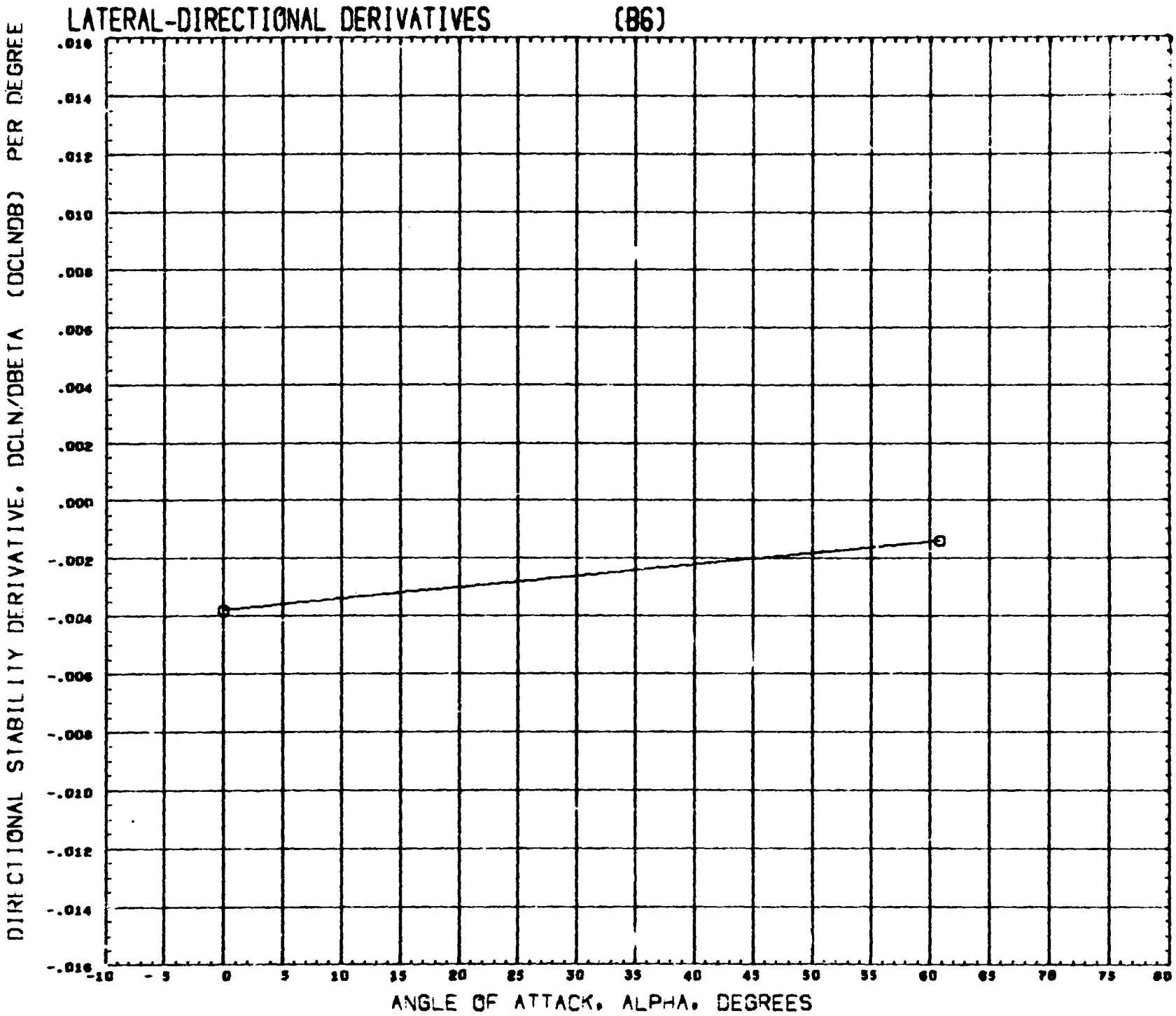


SYMBOL	MACH
O	3.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	-0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

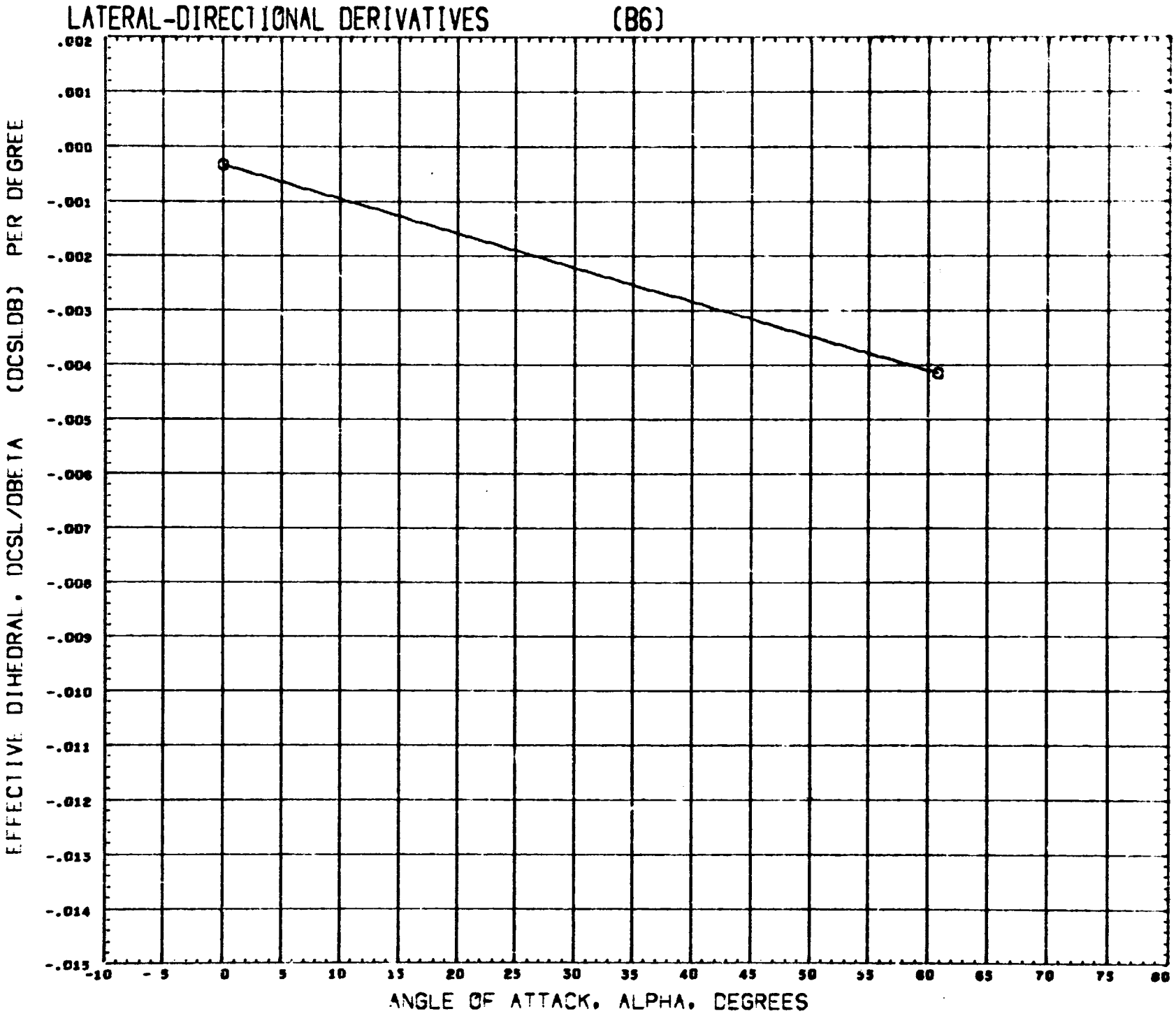


SYMBOL	MACH
O	5.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1500	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

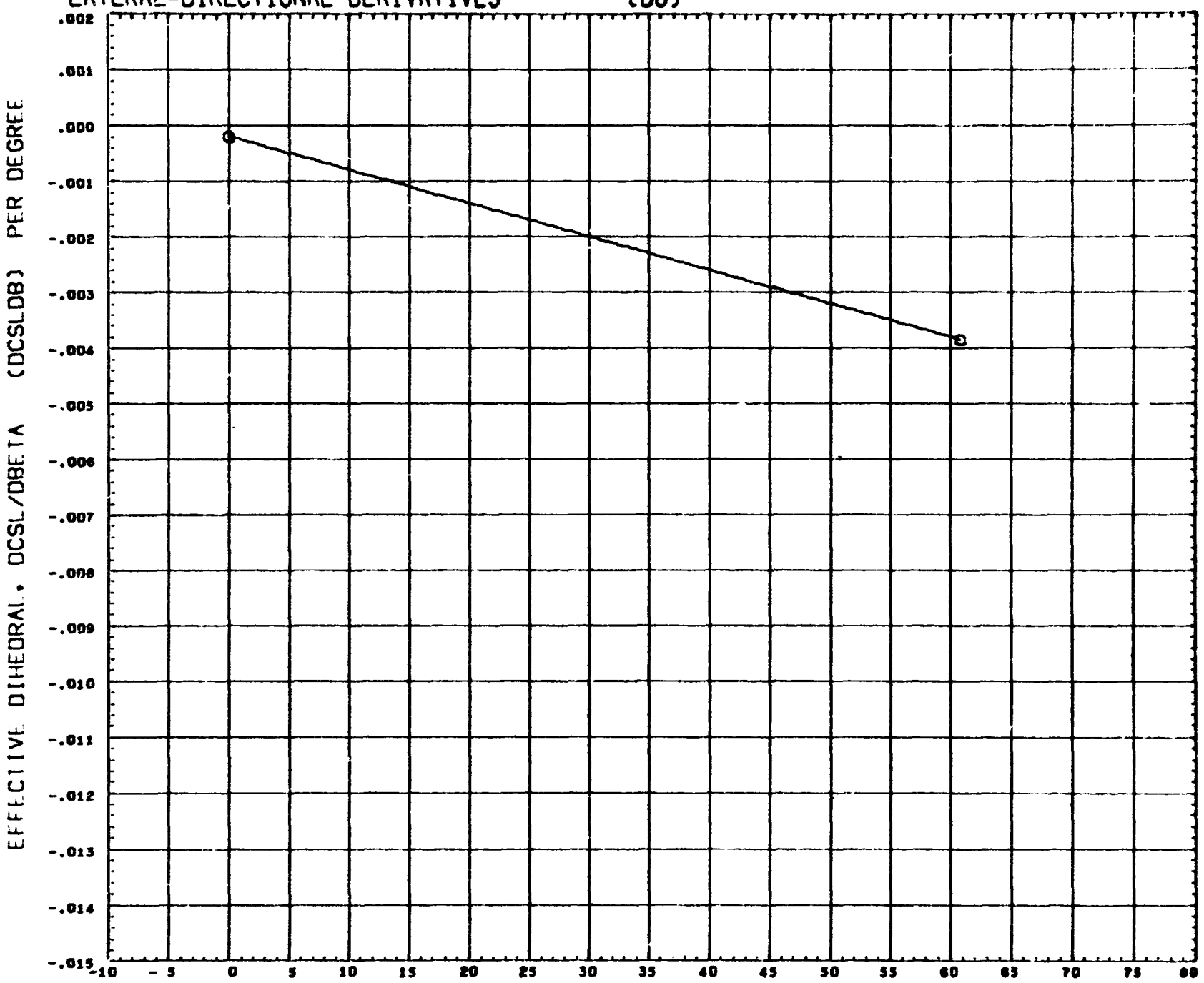


SYMBOL	MACH
O	3.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446



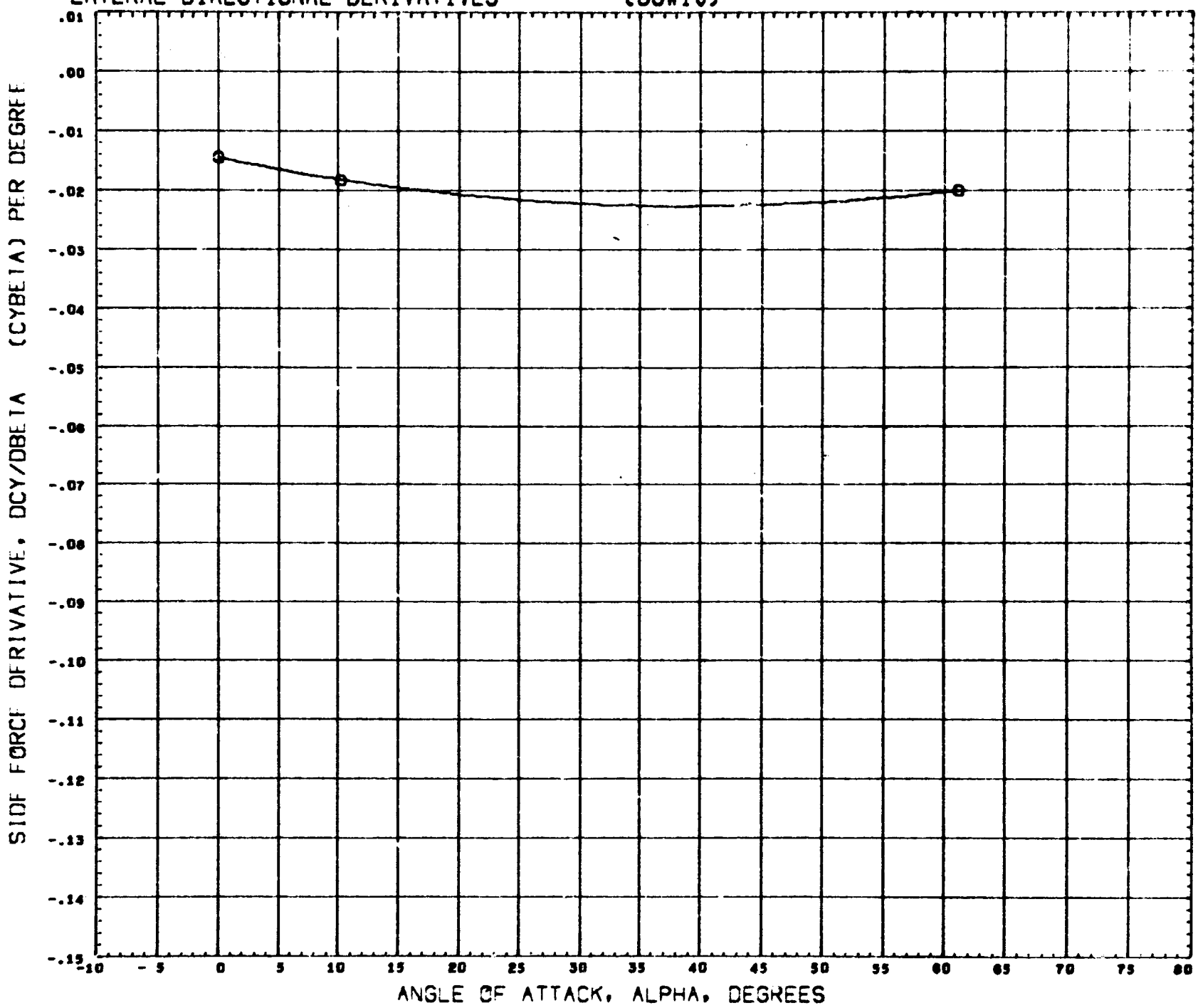
SYMBOL	MACH
O	5.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

LATERAL-DIRECTIONAL DERIVATIVES (B6W10)

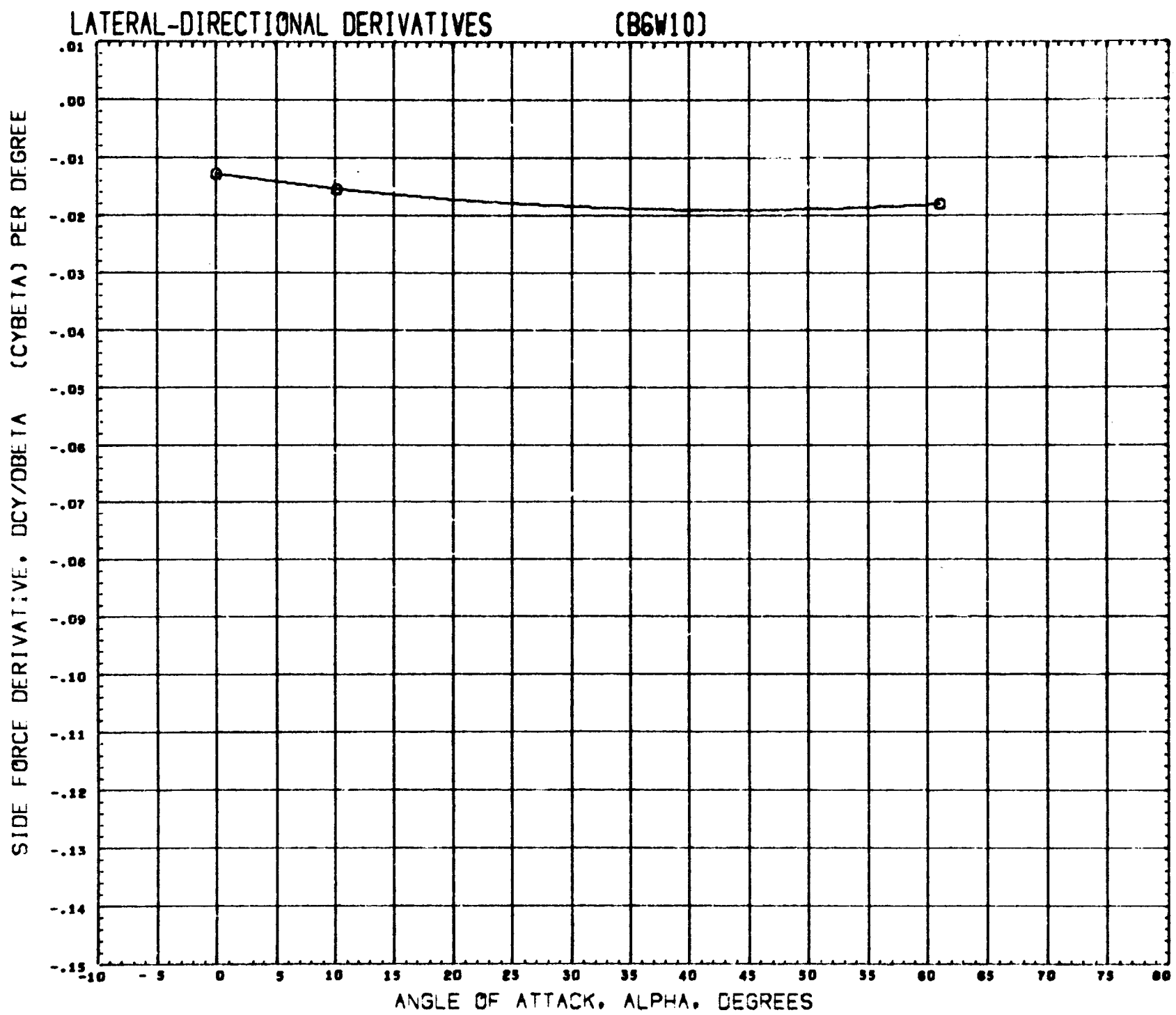


SYMBOL	MACH
O	3.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

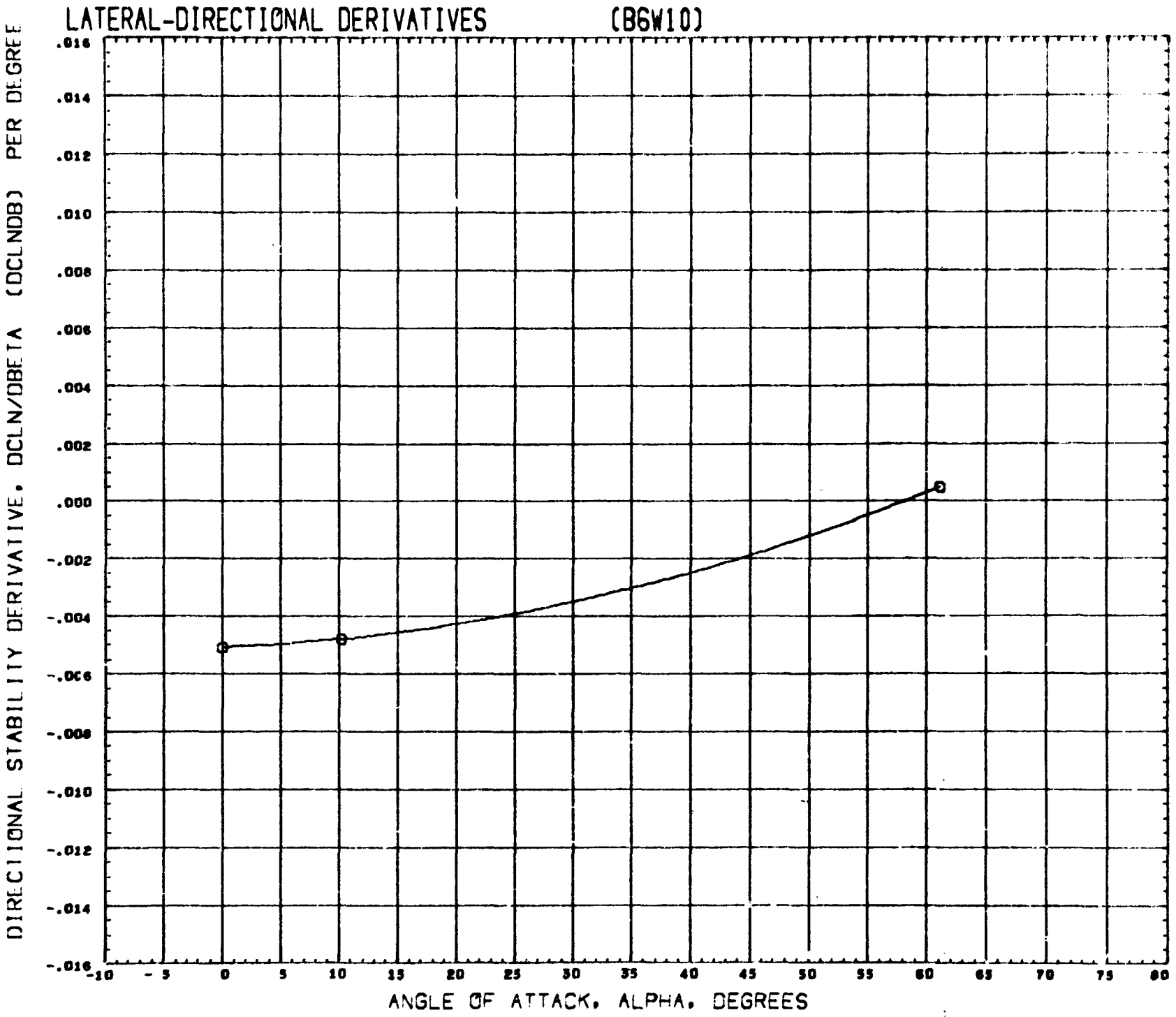


SYMBOL	MACH
O	5.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

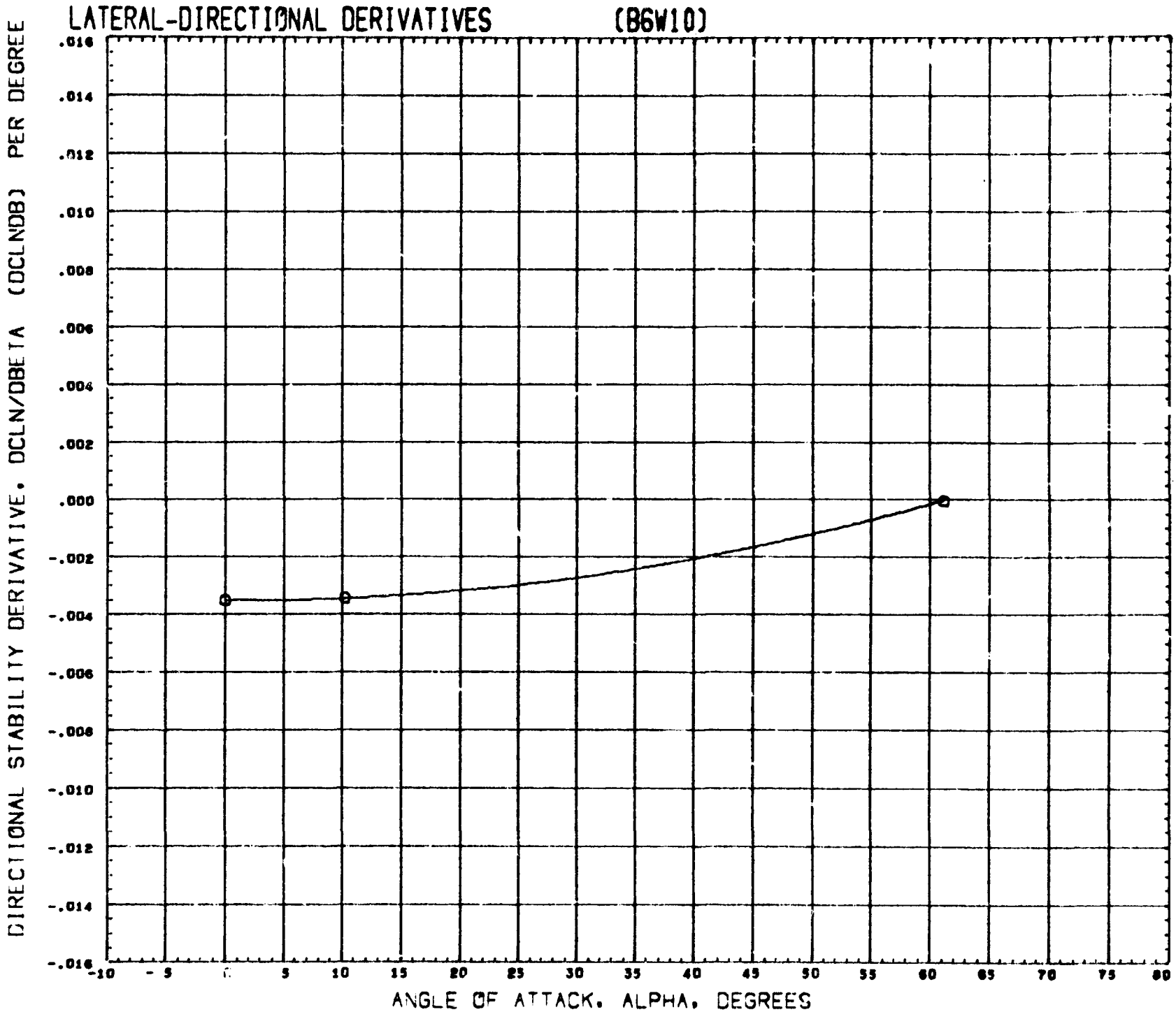


SYMBOL	MACH
O	3.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	-0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446



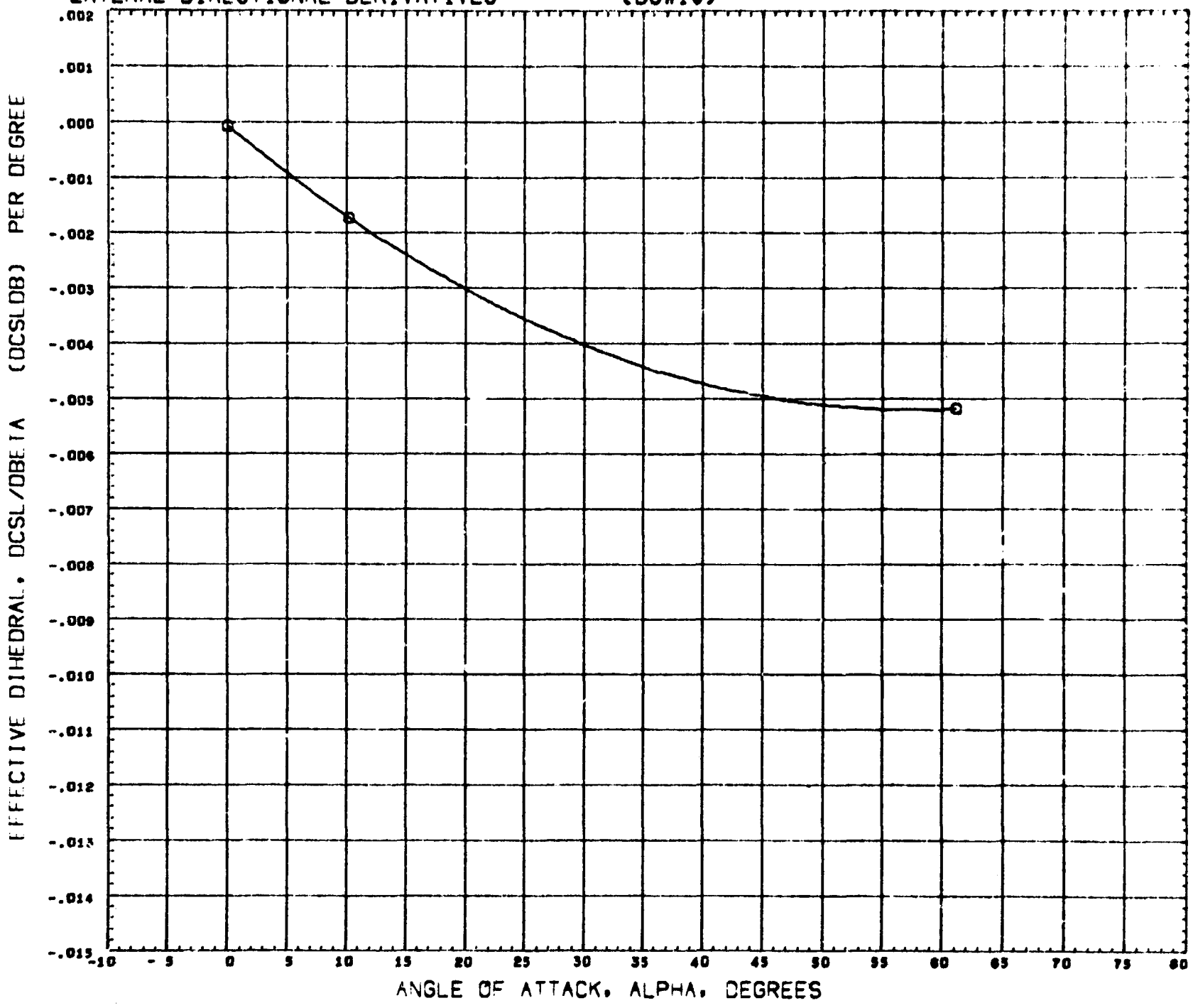
SYMBOL	MACH
O	5.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5280	INCHES
YMRP	0.0000	INCHES
ZMRP	-0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

LATERAL-DIRECTIONAL DERIVATIVES (B6W10)

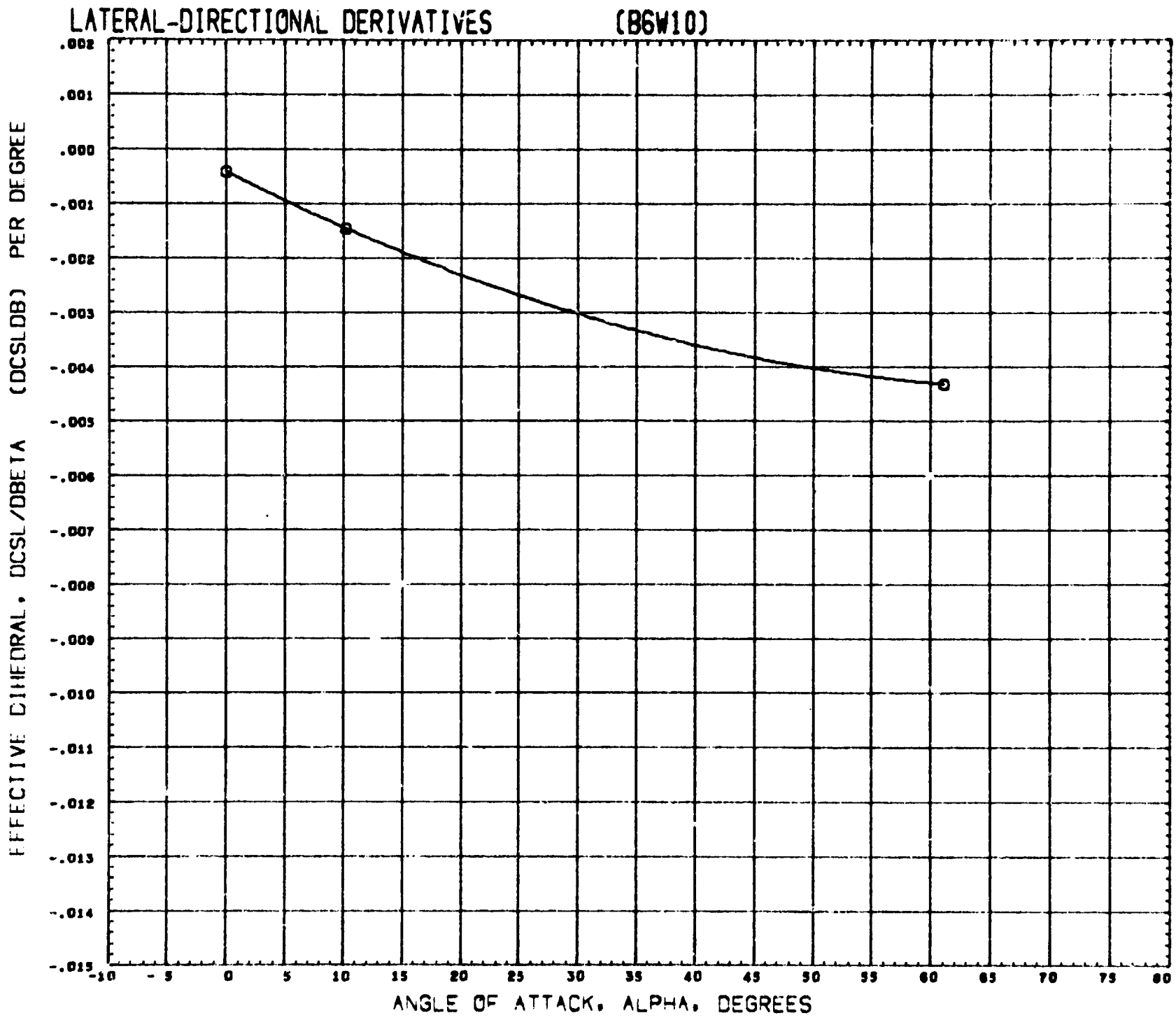


SYMBOL	MACH
O	3.000

REFERENCE INFORMATION

REFS	9.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	-0.1780	INCHES
SCALE	0.0033	SCALE

REFERENCE FILE NA 70 446

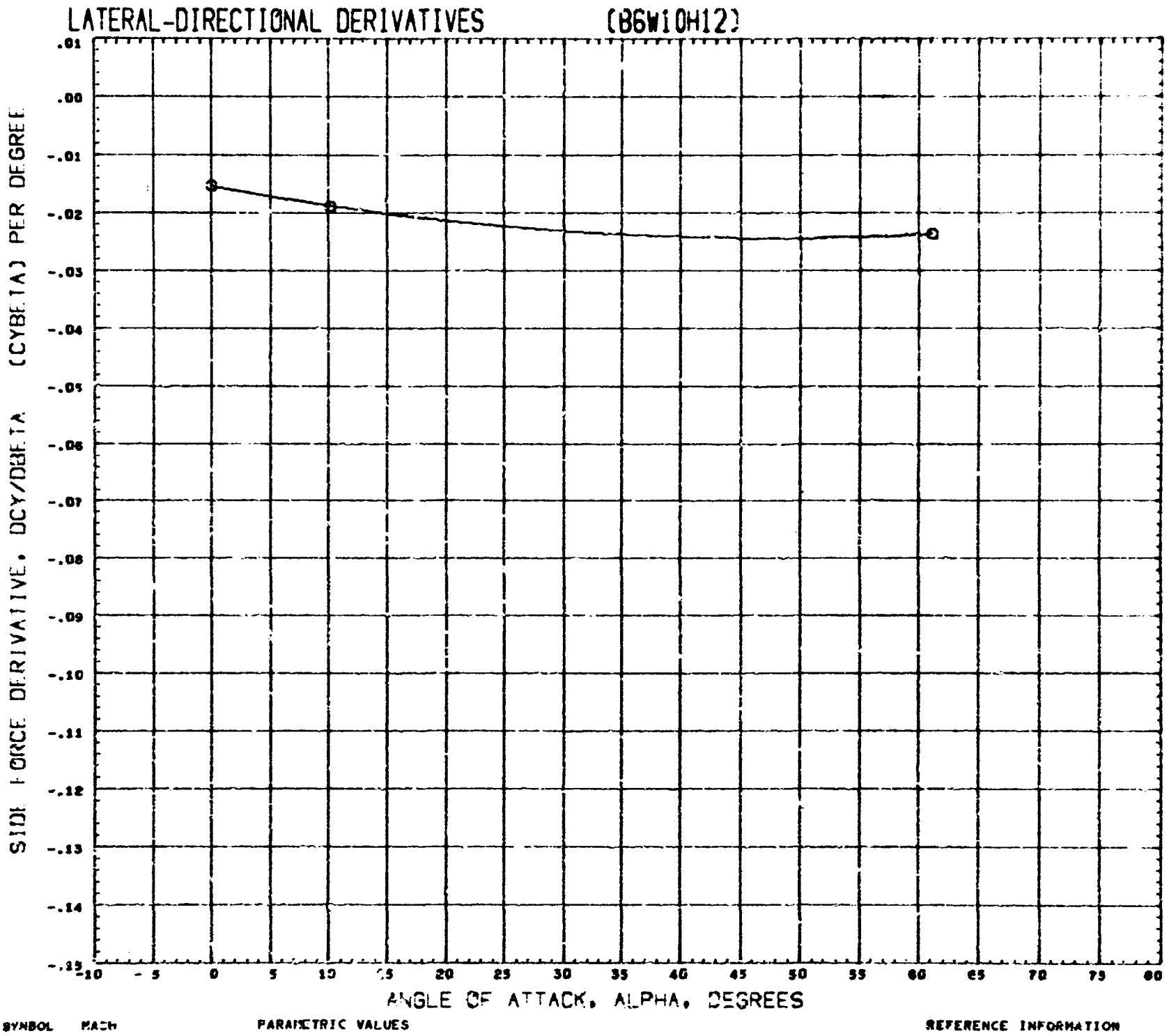


SYMBOL	MACH
O	5.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	-0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

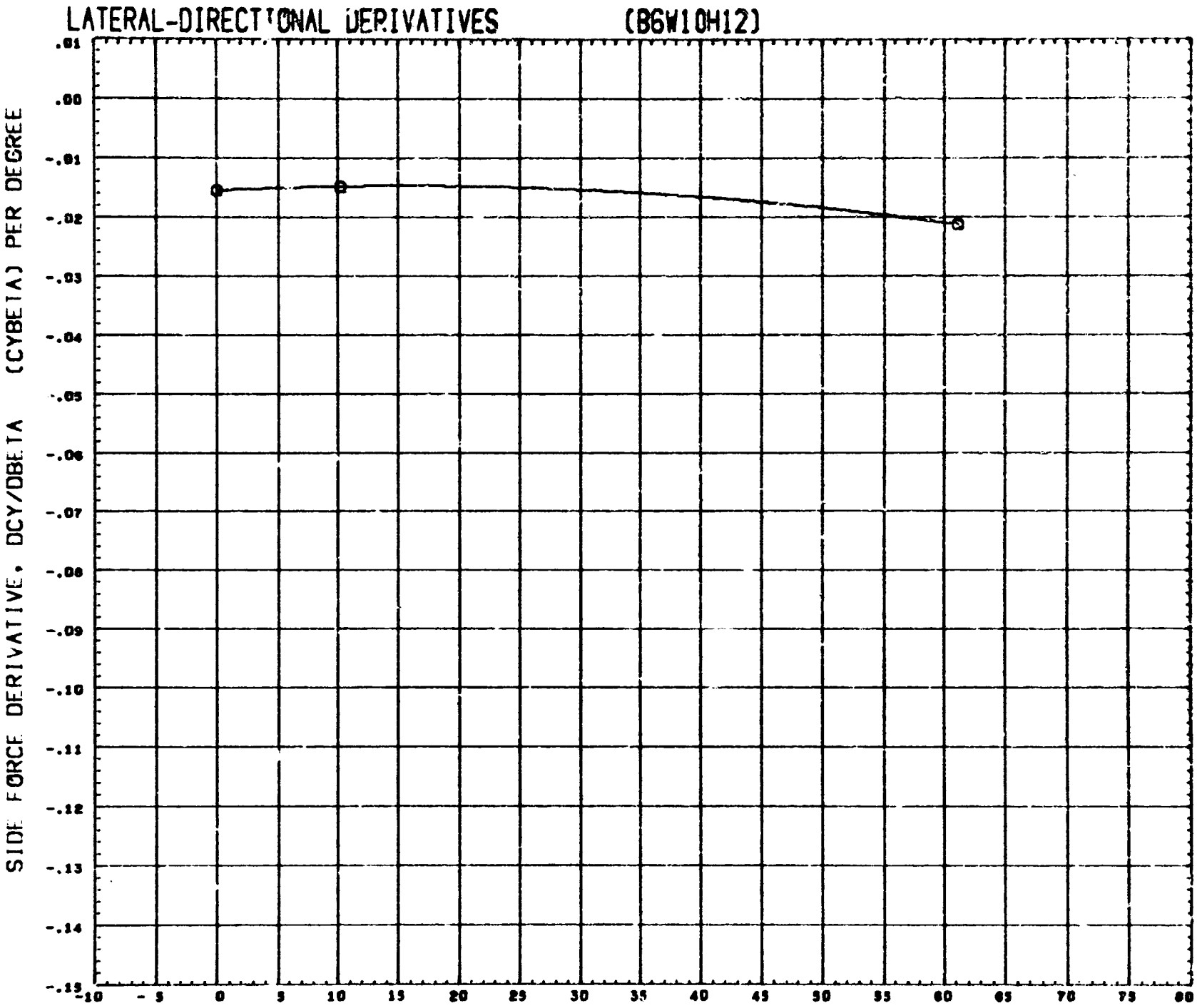


SYMBOL	MACH	PARAMETRIC VALUES	
O	5.000	HZNTL	0.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	0.1700	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

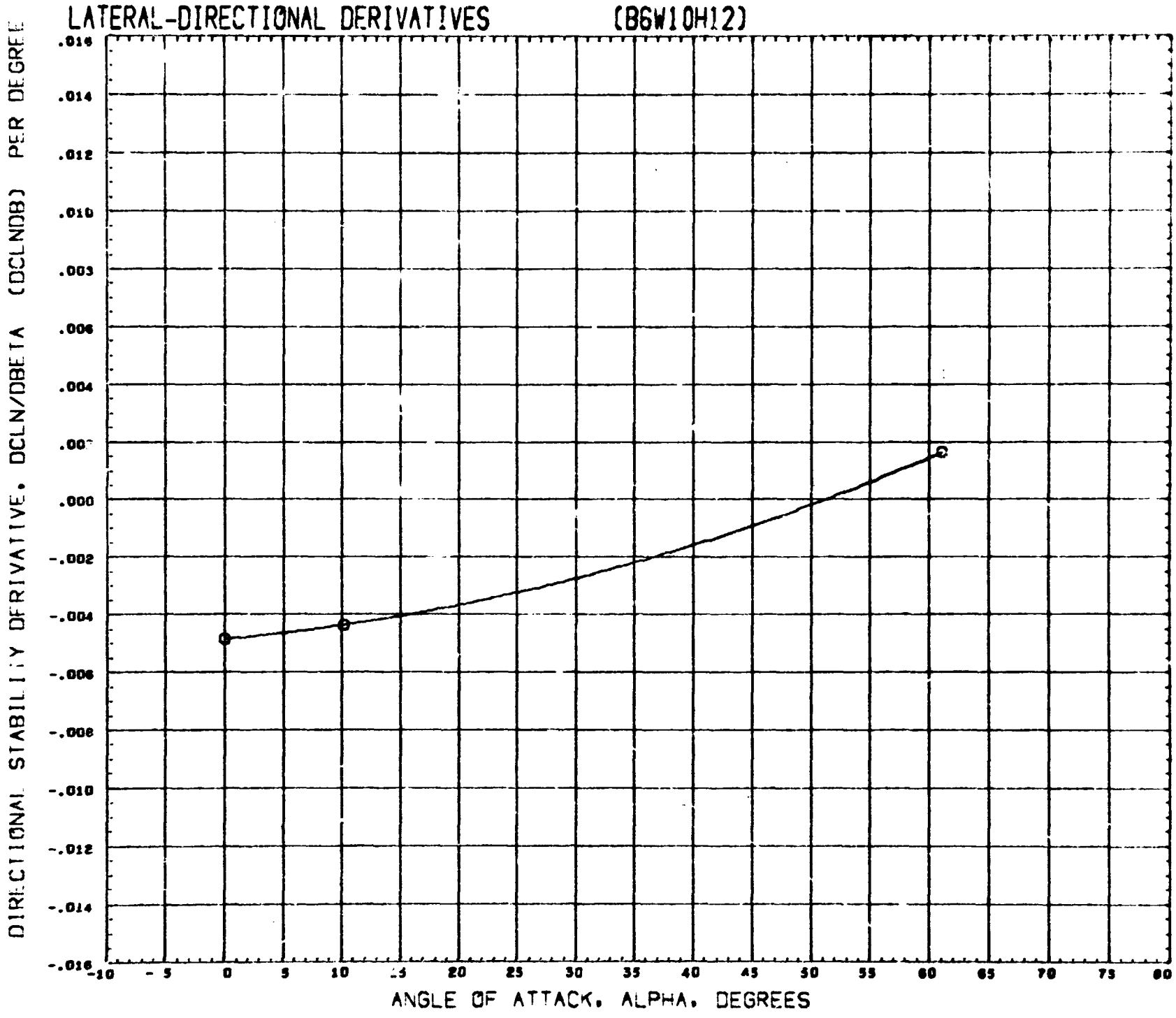


SYMBOL	MACH		PARAMETRIC VALUES
O	5.000	HRZNTL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

LATERAL-DIRECTIONAL DERIVATIVES (B6W10H12)



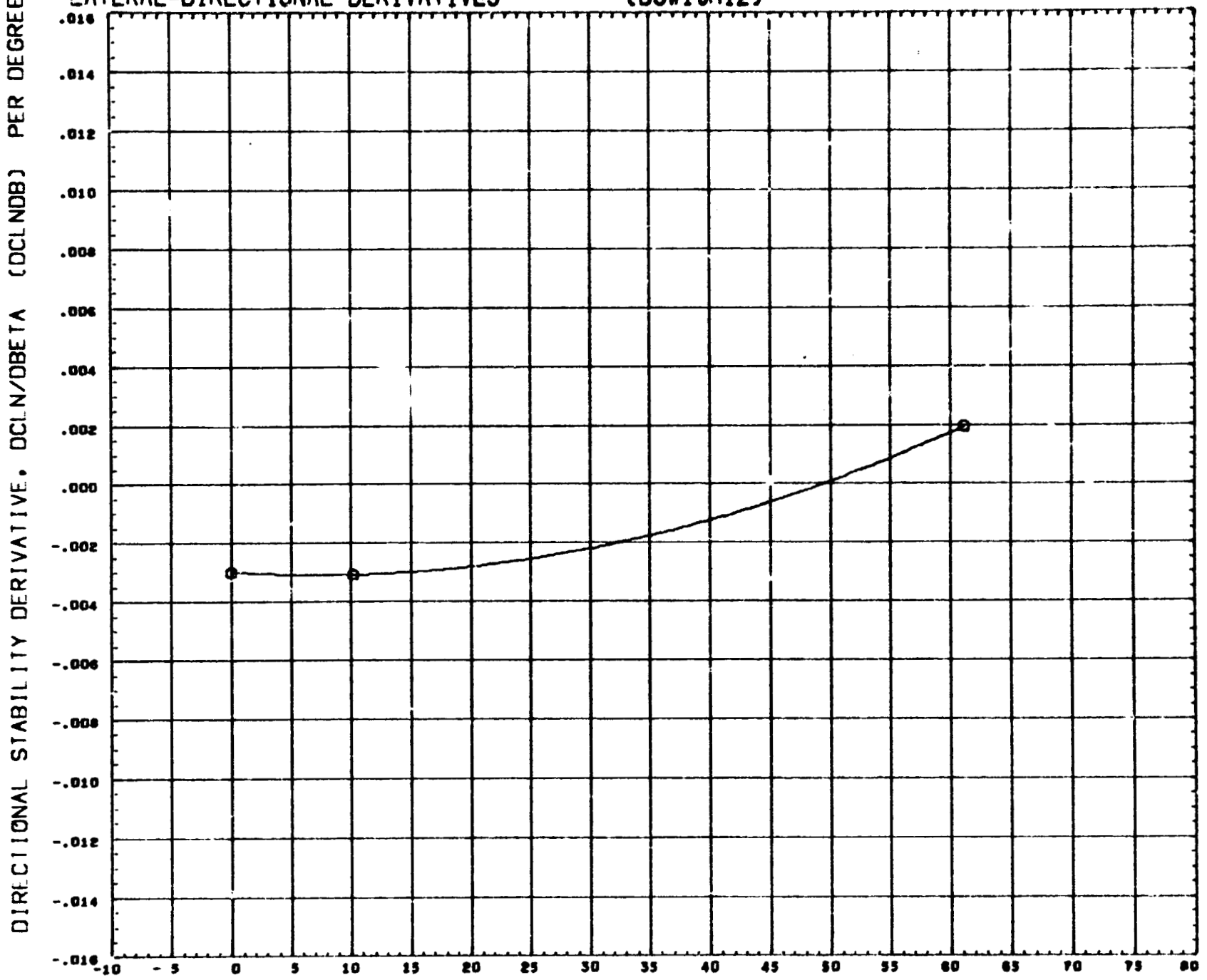
SYMBOL	MACH		PARAMETRIC VALUES
O	3.010	HRZNTL	0.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

LATERAL-DIRECTIONAL DERIVATIVES (B6W10H12)



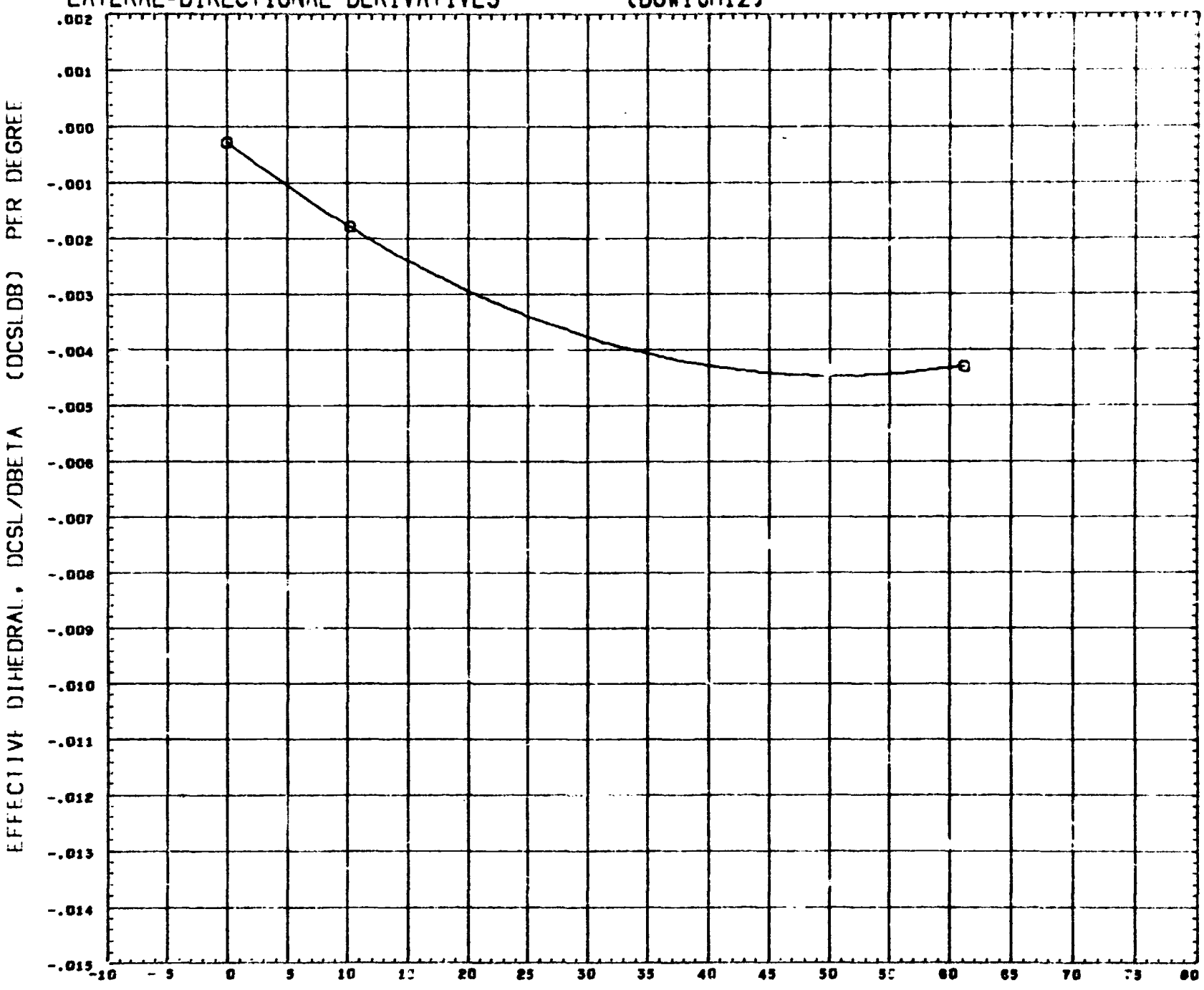
SYMBOL	MACH	PARAMETRIC VALUES	
O	5.000	HRZNTL	0.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

LATERAL-DIRECTIONAL DERIVATIVES (B6W10H12)

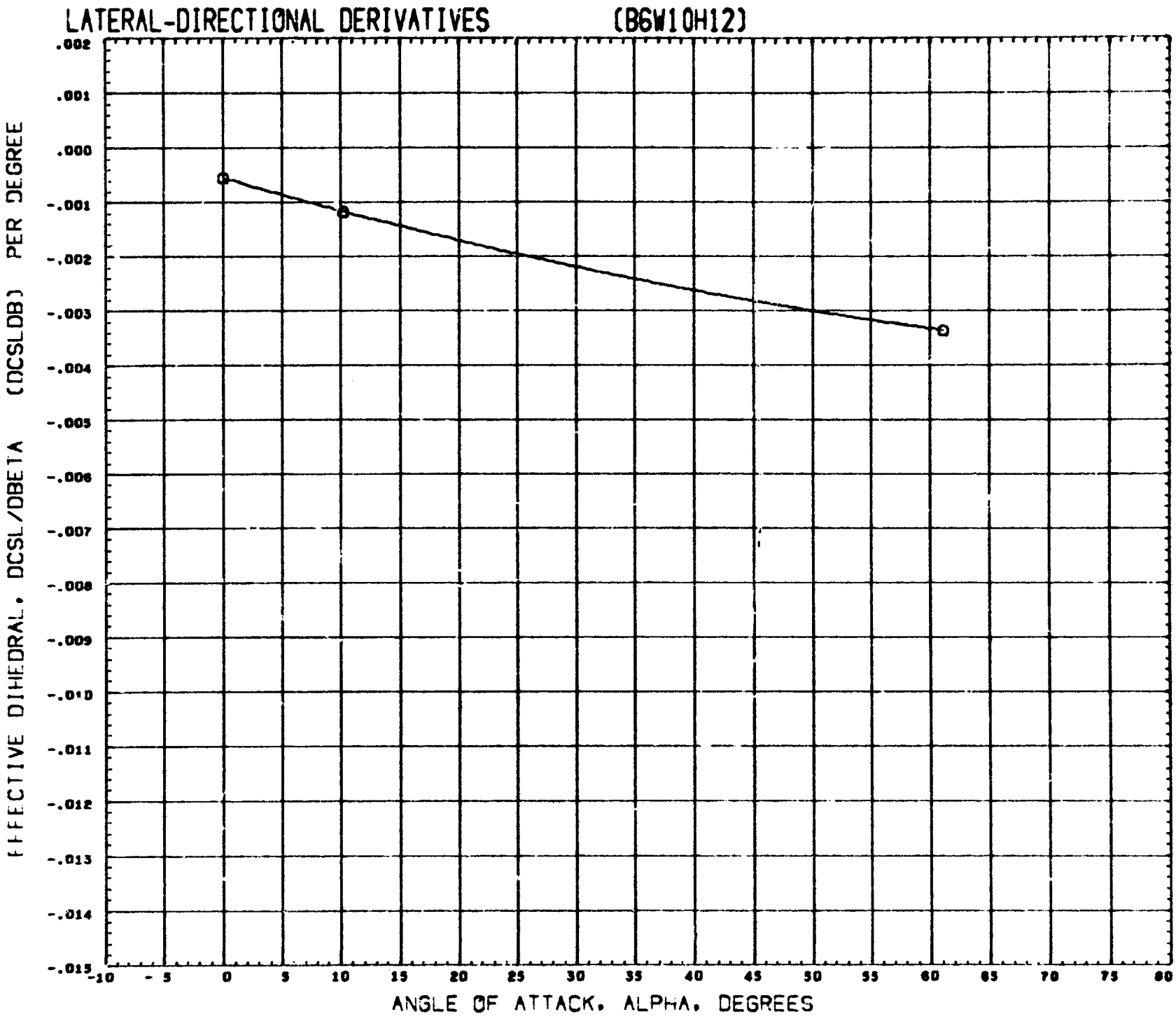


SYMBOL	MACH	PARAMETRIC VALUES	
O	3.000	HRZNTL	0.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

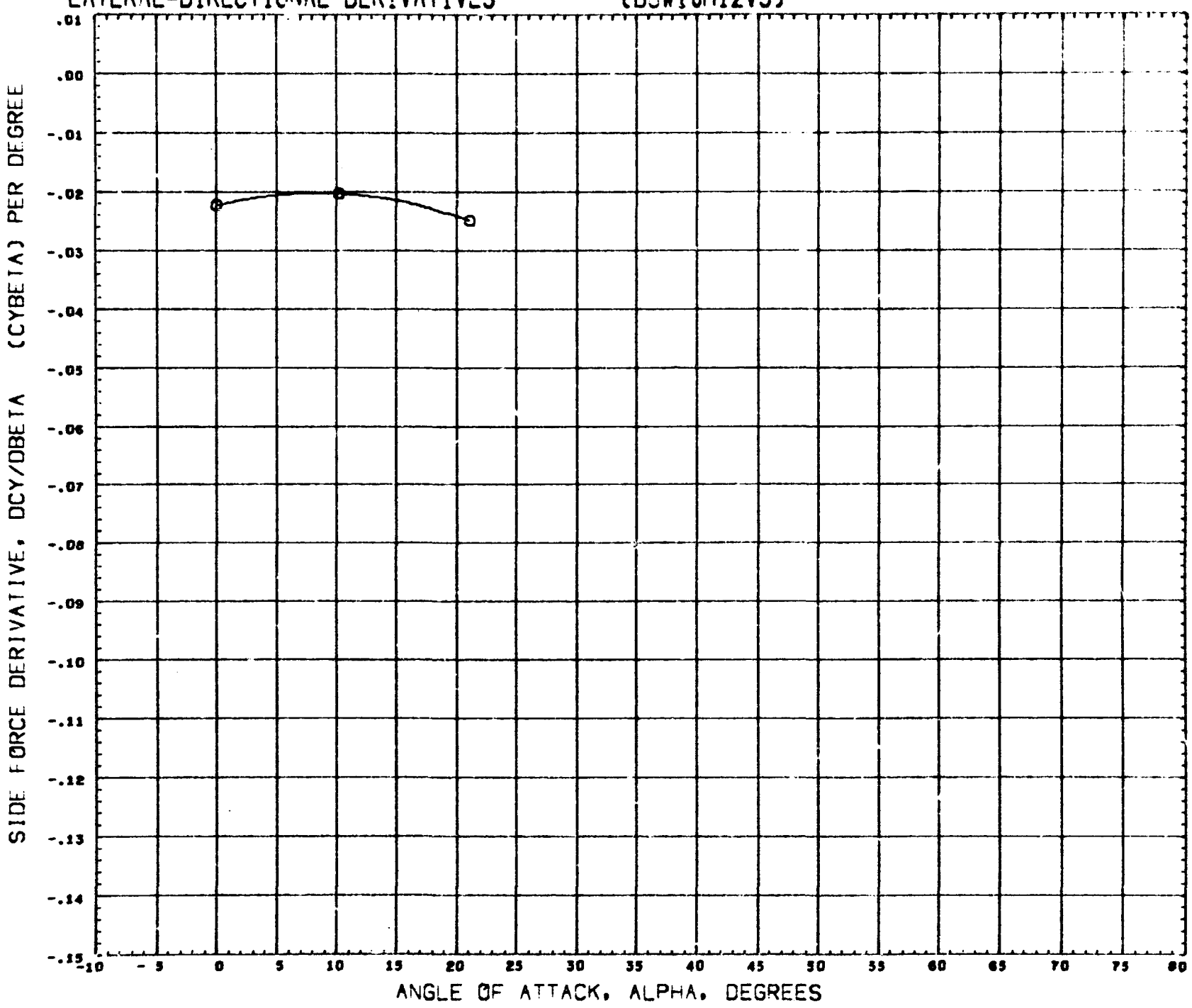


SYMBOL	MACH		PARAMETRIC VALUES
□	5.000	HRZNTL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	0.1780	INCHES
SCALE	0.0035	SCALE

LATERAL-DIRECTIONAL DERIVATIVES (BSW10H12V5)



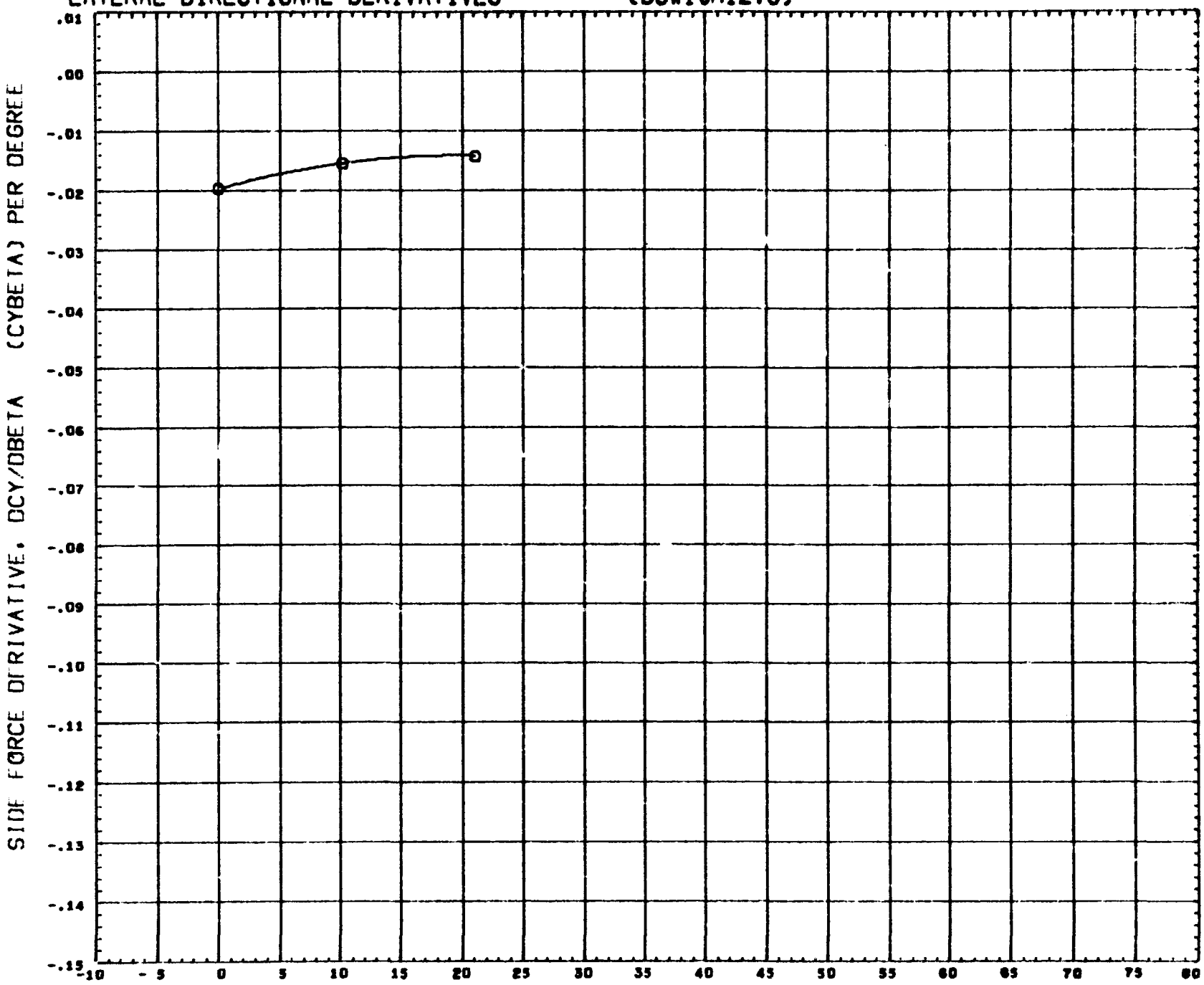
SYMBOL	MACH	PARAMETRIC VALUES	
O	3.000	HRZNTL	0.000

REFERENCE INFORMATION

REFS	.4300	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	0.1780	INCHES
SCALE	0.0039	SCALE

REFERENCE FILE NA 70 446

LATERAL-DIRECTIONAL DERIVATIVES (B6W10H12V5)



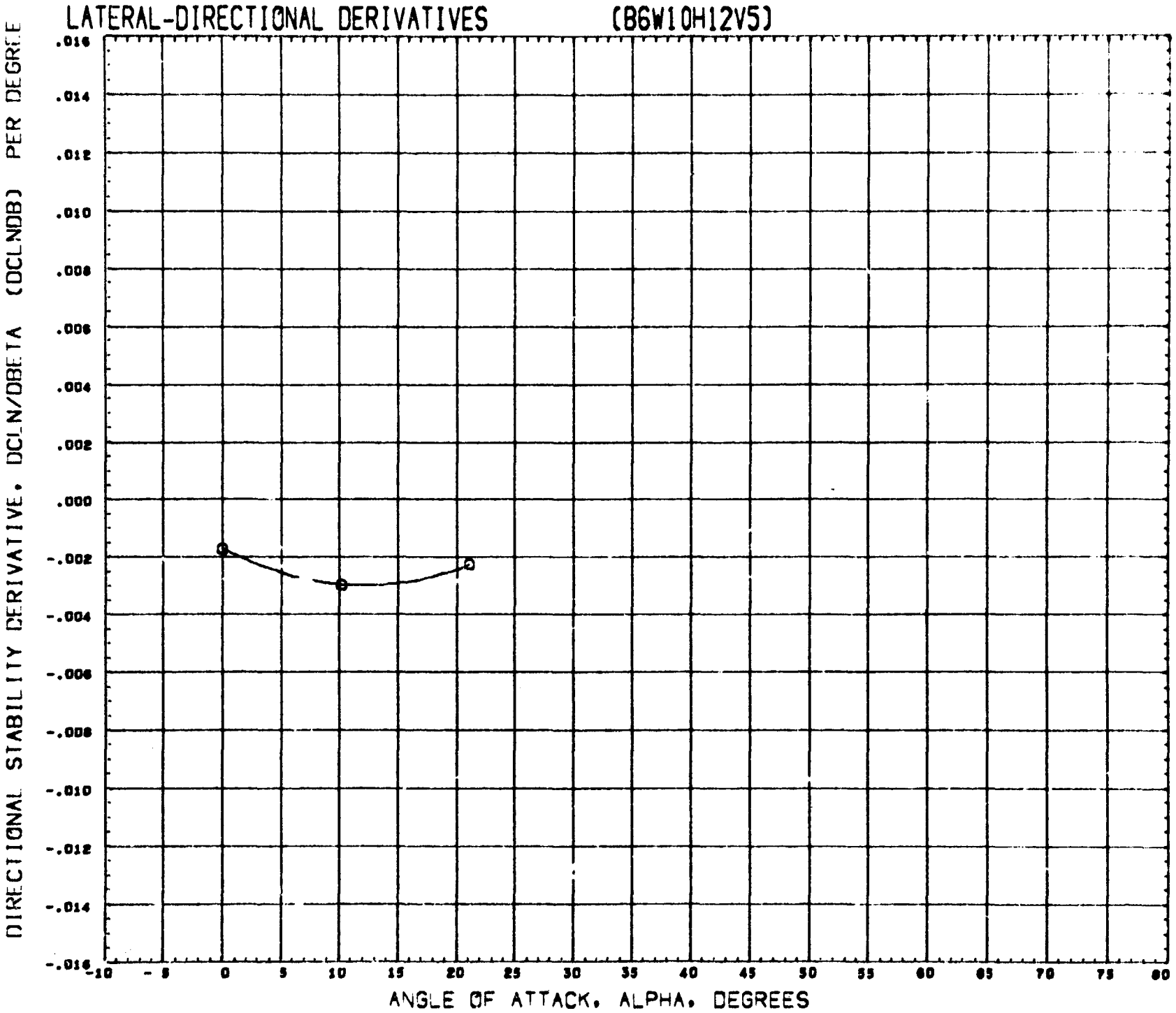
SYMBOL	MACH		PARAMETRIC VALUES
O	5.000	HRZNTL	0.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0055	SCALE

REFERENCE FILE NA 70 446

LATERAL-DIRECTIONAL DERIVATIVES (B6W10H12V5)

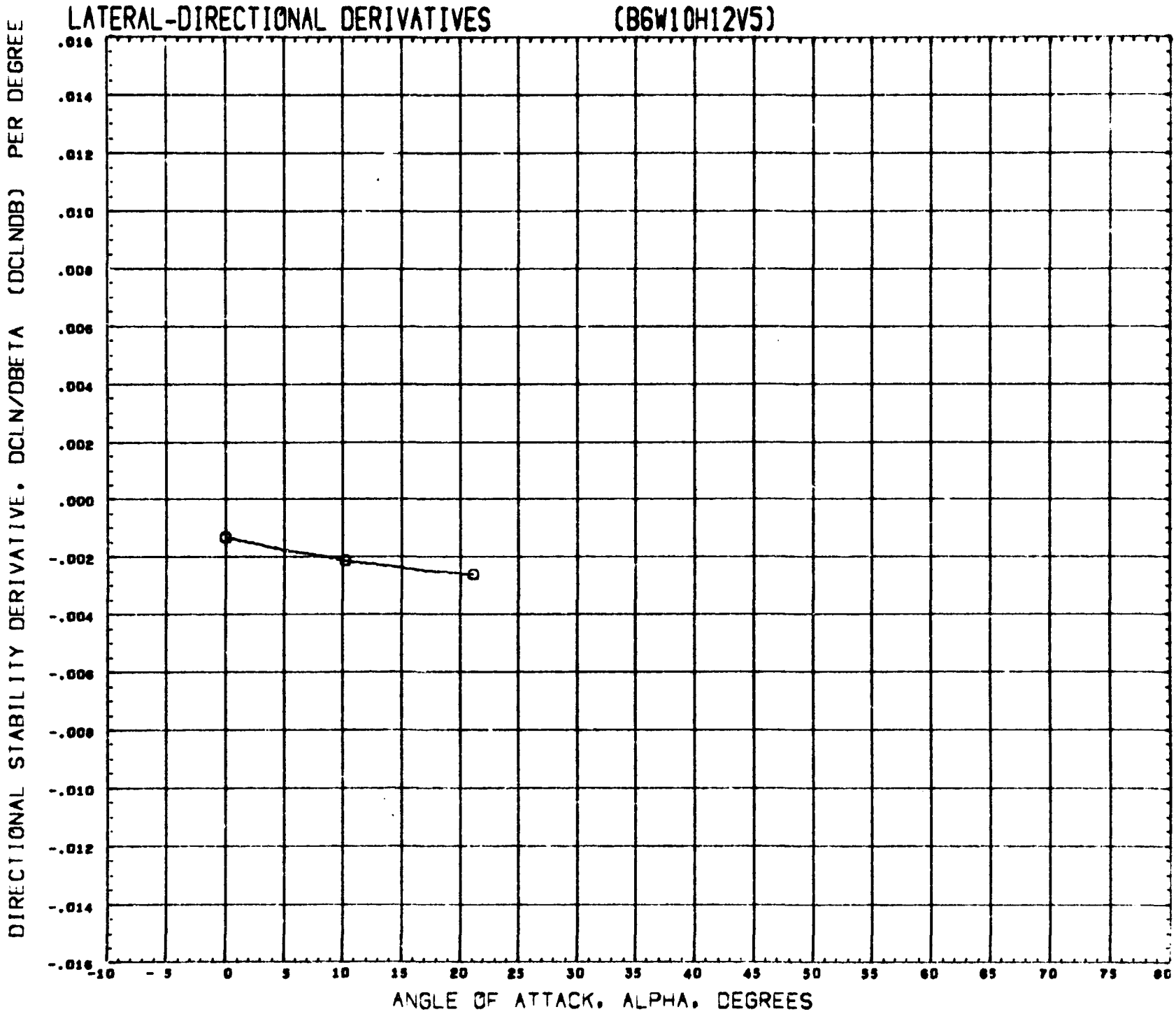


SYMBOL	MACH		PARAMETRIC VALUES
O	3.000	HRZNTL	0.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

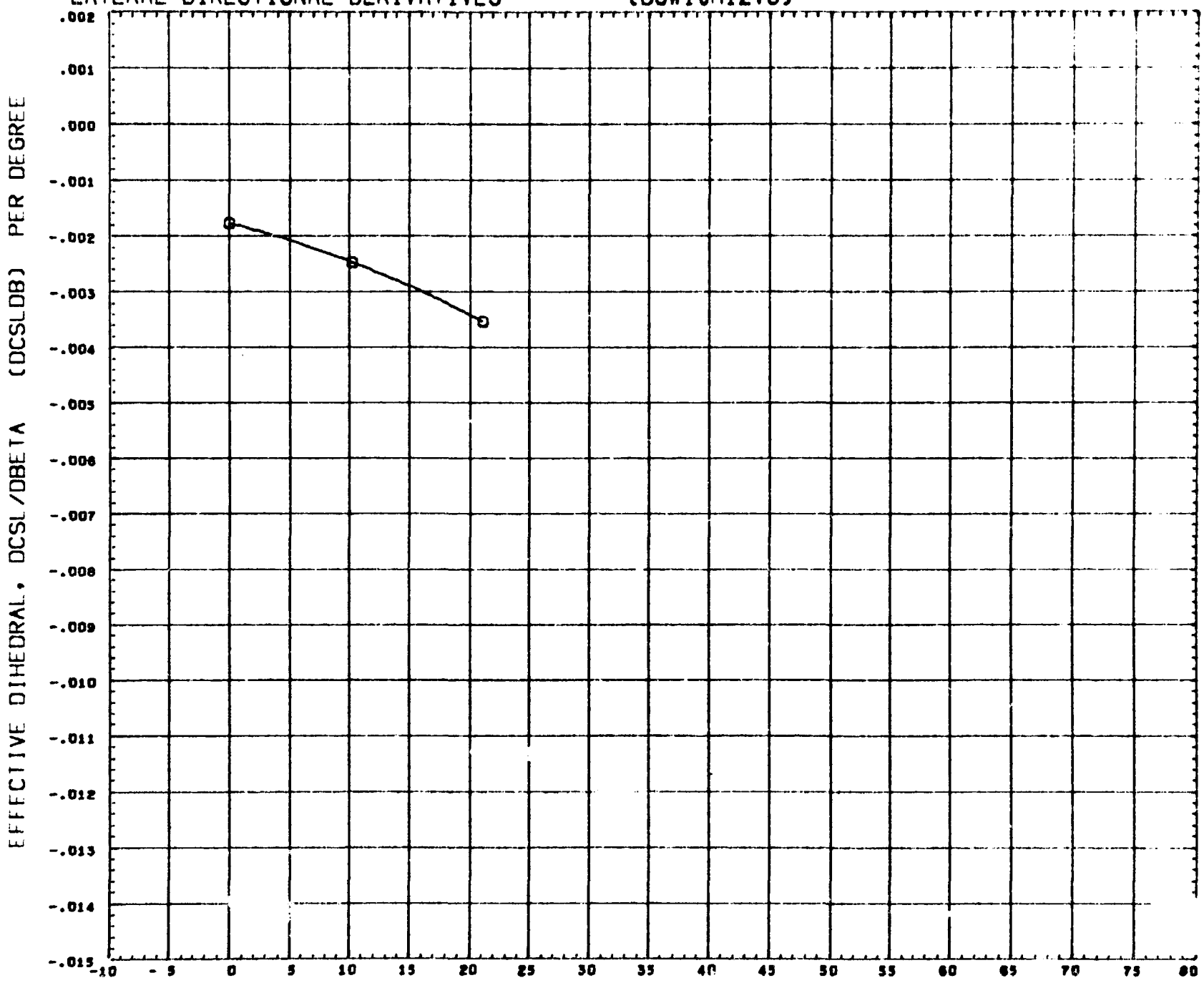


SYMBOL	MACH		PARAMETRIC VALUES
O	5.000	HRZNTL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

LATERAL-DIRECTIONAL DERIVATIVES (B6W10H12V5)

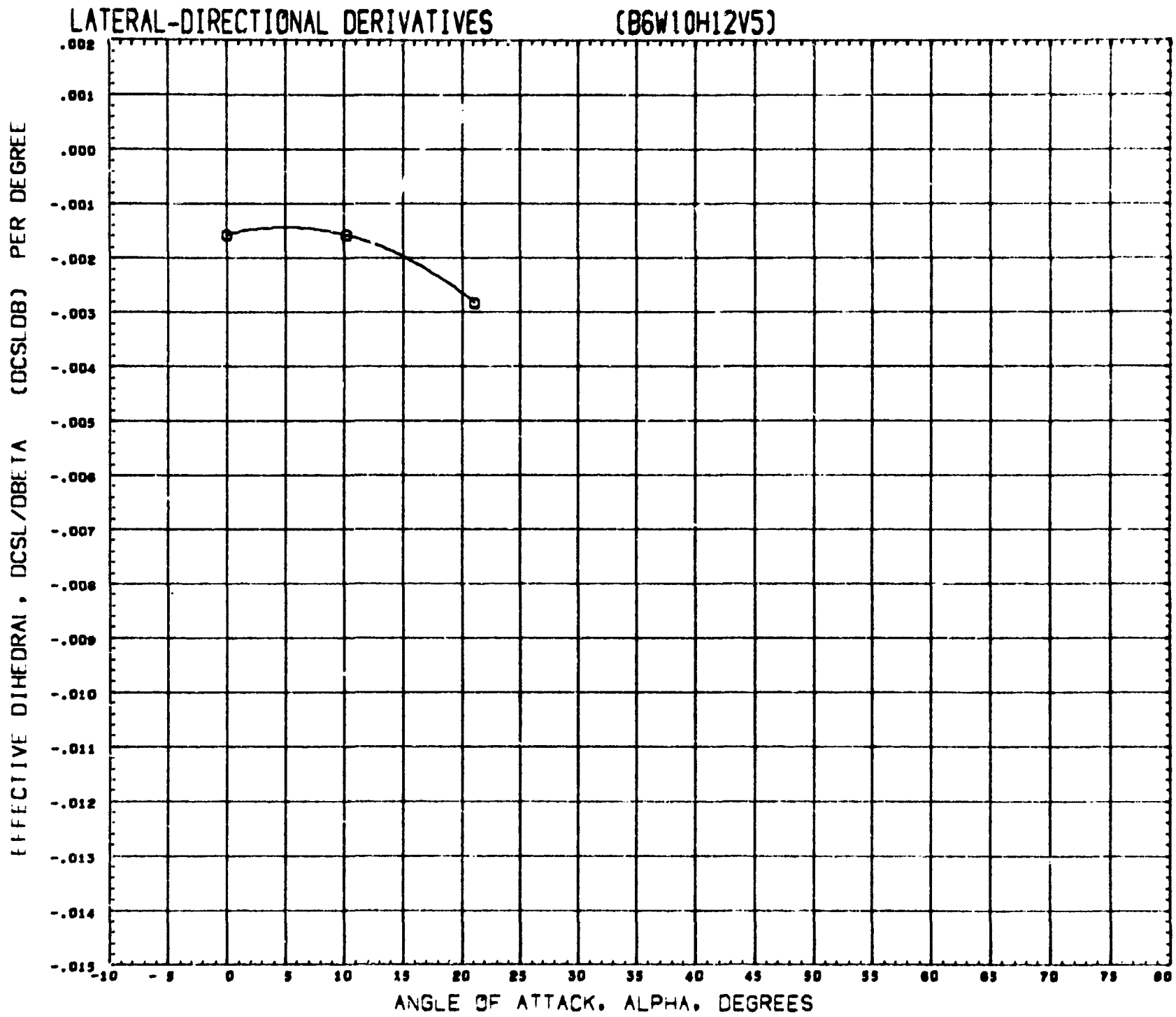


SYMBOL	MACH		PARAMETRIC VALUES
O	3.000	HRZNTL	0.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFB	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP	-0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446



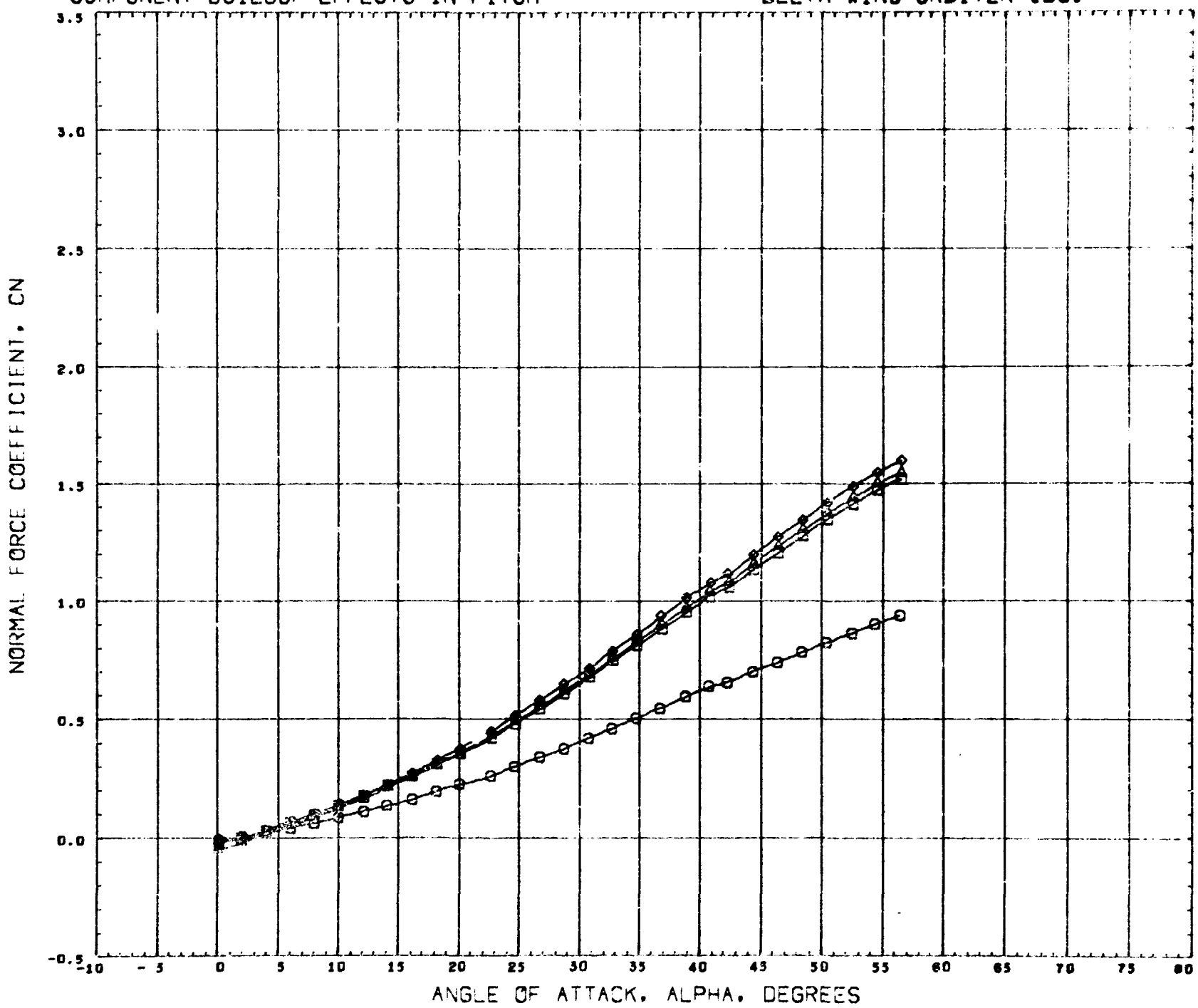
SYMBOL	MACH		PARAMETRIC VALUES
O	5.000	HRZNTL	0.000

REFERENCE INFORMATION

REFS	5.4400	SQINCH
REFL	1.1300	INCHES
REFQ	5.2150	INCHES
XMRP	4.5260	INCHES
YMRP	0.0000	INCHES
ZMRP -	0.1780	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

COMPONENT BUILDUP EFFECTS IN PITCH DELTA WING ORBITER (B5)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2101S)	○	MSFC 468 NR DELTA ORBITER B5
(S2102S)	□	MSFC 468 NR DELTA ORBITER B5W13E2
(S2103S)	◇	MSFC 468 NR DELTA ORBITER B5W14E3
(S2104S)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.959

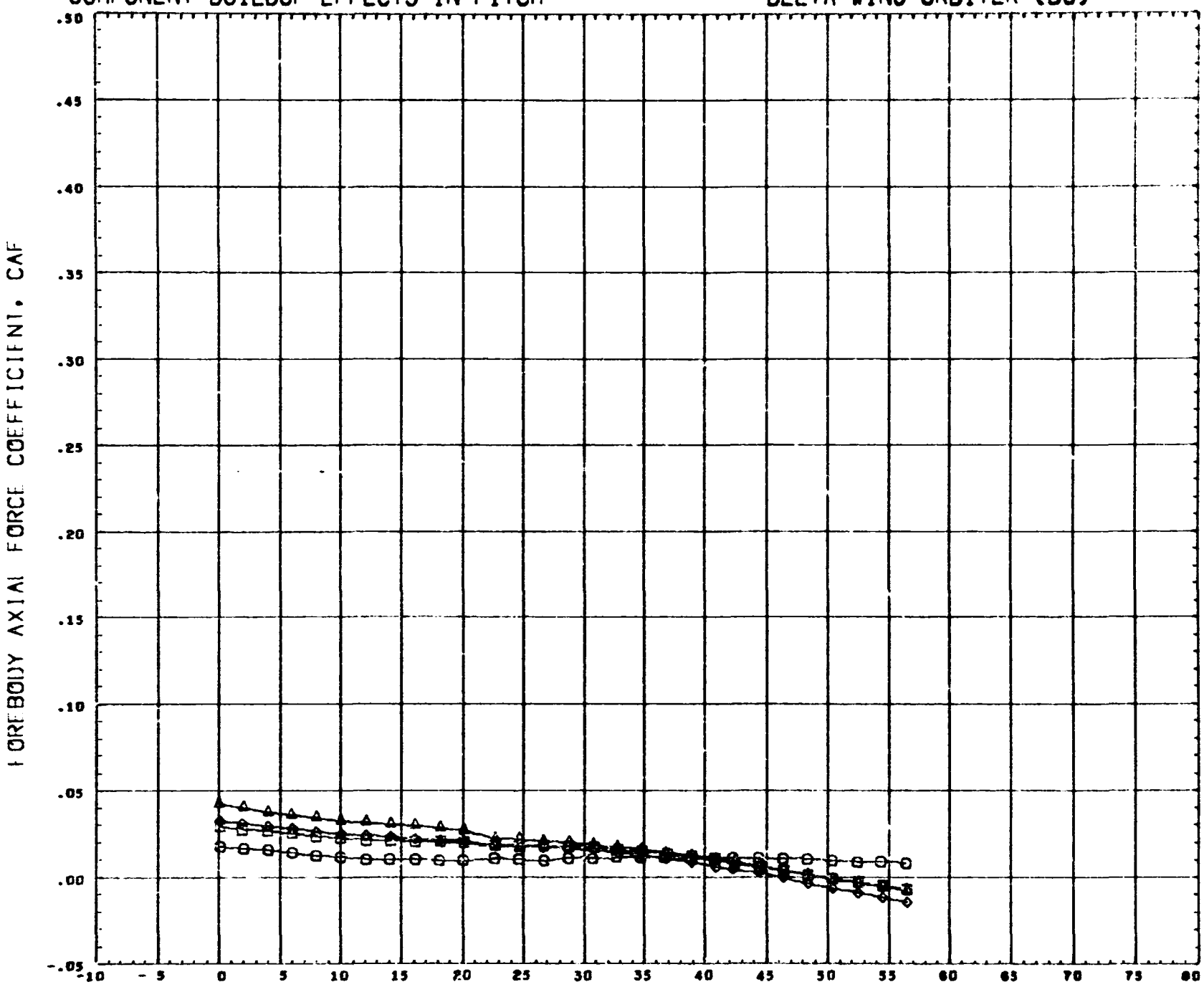
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMPP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH DELTA WING ORBITER (B5)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2101S)	○	MSFC 468 NR DELTA ORBITER B5
(S2102S)	□	MSFC 468 NR DELTA ORBITER B5W13E2
(S2103S)	◇	MSFC 468 NR DELTA ORBITER B5W14E3
(S2104S)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.959

PARAMETRIC VALUES

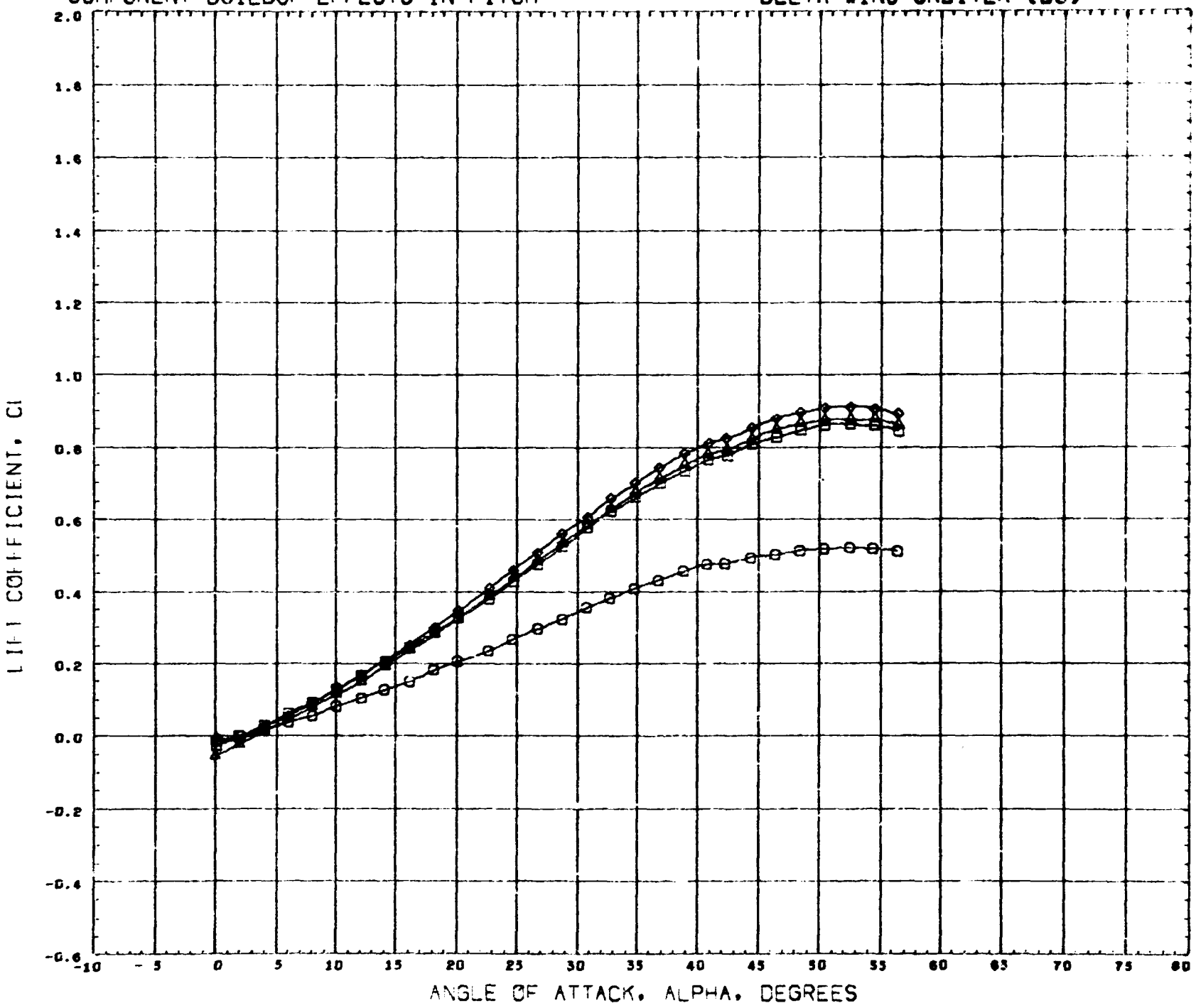
BETA 0.000

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	6.455	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

DELTA WING ORBITER (B5)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2101S)	○	MSFC 468 NR DELTA ORBITER B5
(S2102S)	□	MSFC 468 NR DELTA ORBITER B5W13E2
(S2103S)	◇	MSFC 468 NR DELTA ORBITER B5W14E3
(S2104S)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.959

FARAMETRIC VALUES

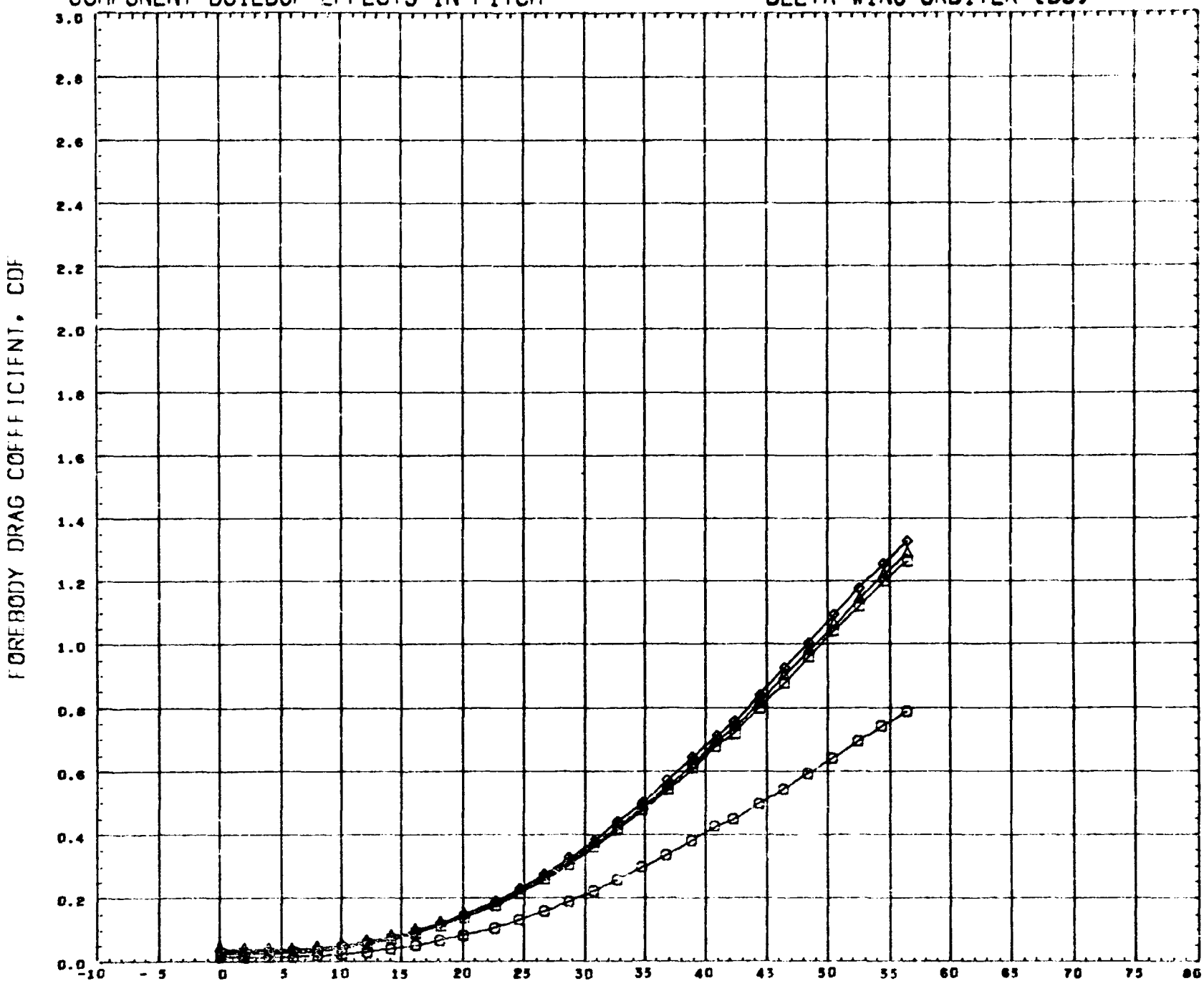
BETA 0.000

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.674	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

DELTA WING ORBITER (B5)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2101S)	○	MSFC 468 NR DELTA ORBITER B5
(S2102S)	□	MSFC 468 NR DELTA ORBITER B5W13E2
(S2103S)	◇	MSFC 468 NR DELTA ORBITER B5W14E3
(S2104S)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.959

PARAMETRIC VALUES

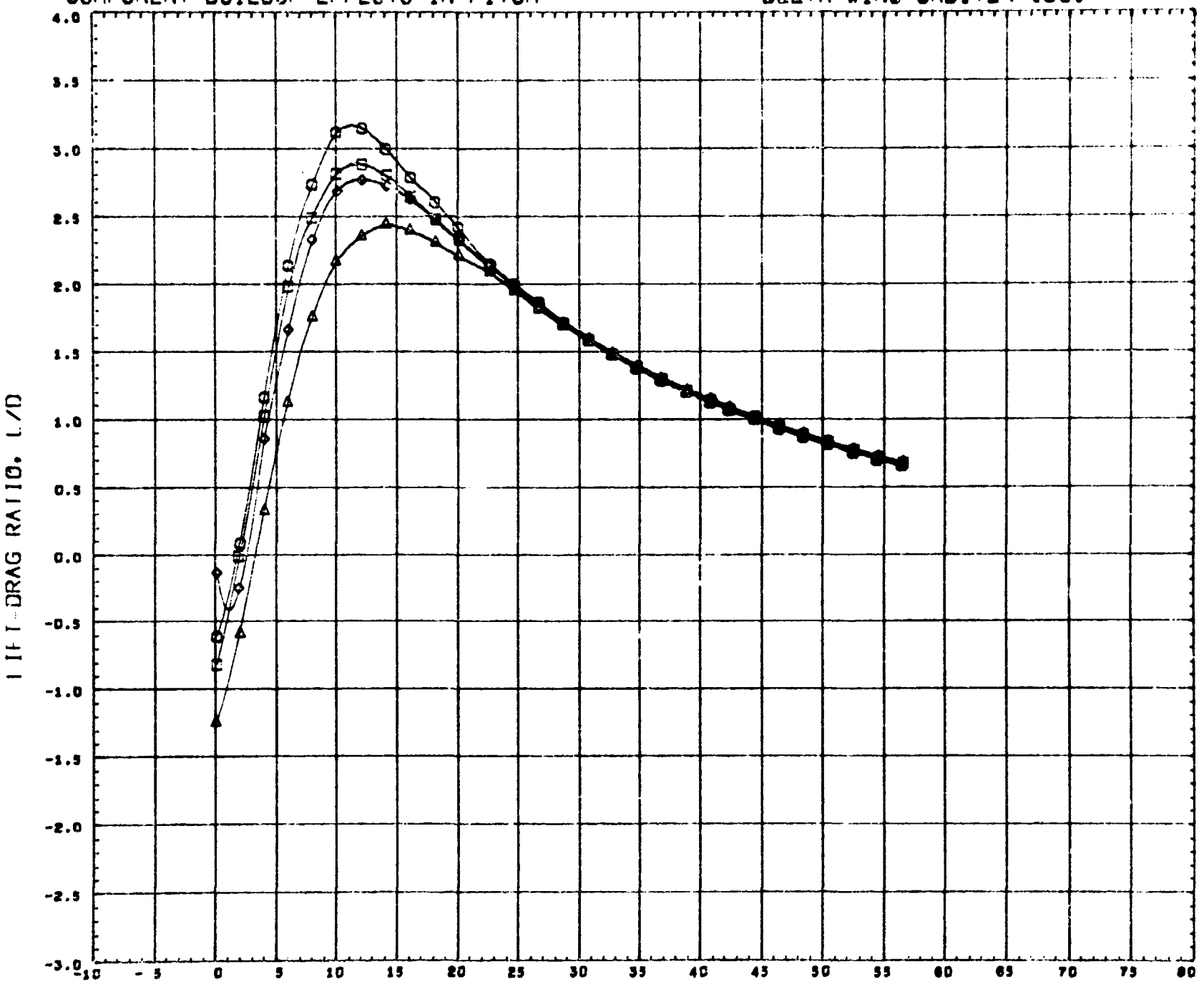
BETA 0.000

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRF	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

DELTA WING ORBITER (B5)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S21018)	○	MSFC 468 NR DELTA ORBITER B5
(S21028)	□	MSFC 468 NR DELTA ORBITER B5W13E2
(S21038)	◇	MSFC 468 NR DELTA ORBITER B5W14E3
(S21048)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.959

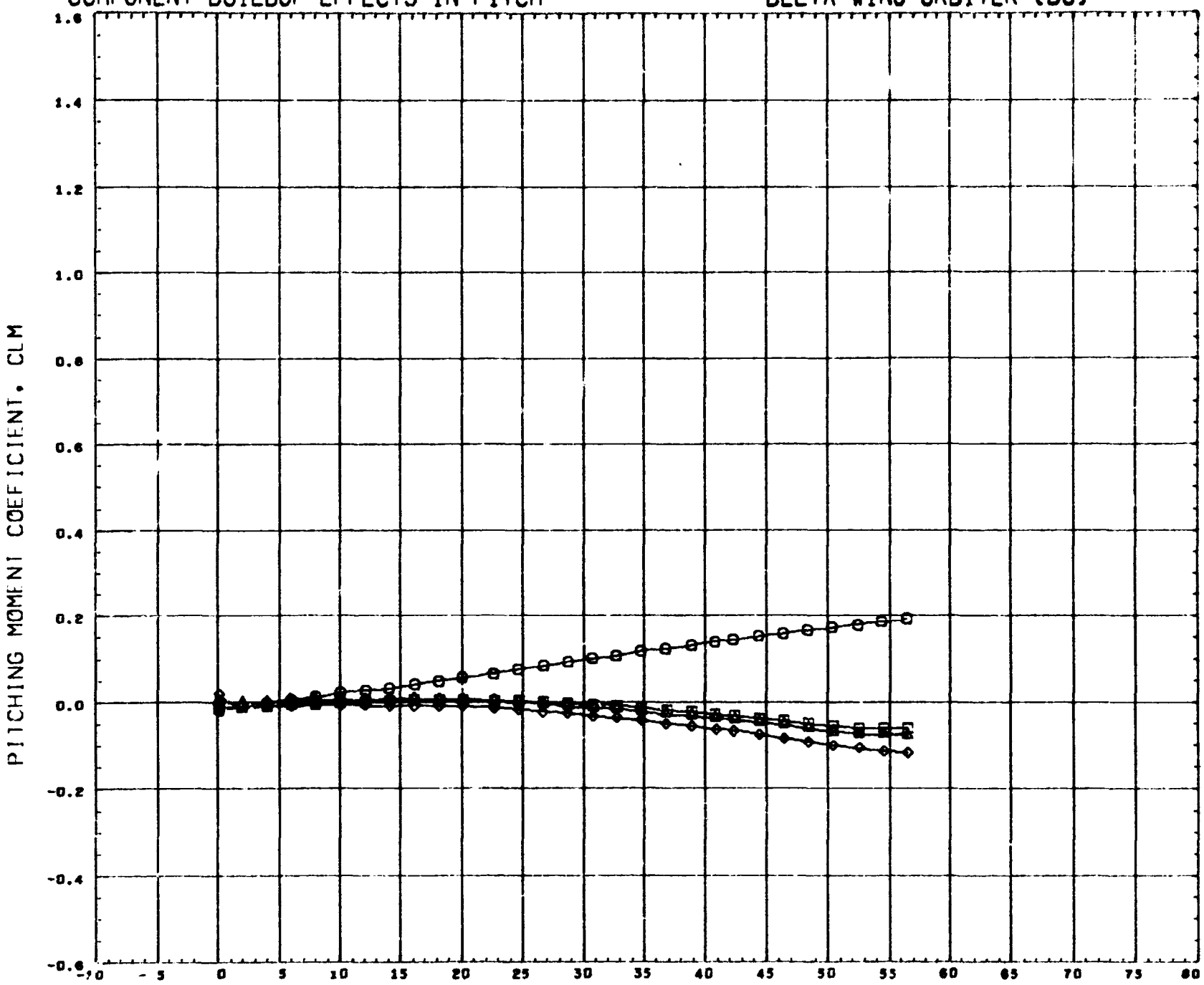
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH DELTA WING ORBITER (B5)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(S2101S)	○	MSFC 468 NR DELTA ORBITER B5
(S2102S)	□	MSFC 468 NR DELTA ORBITER B5W13E2
(S2103S)	◇	MSFC 468 NR DELTA ORBITER B5W14E3
(S2104S)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.959

PARAMETRIC VALUES

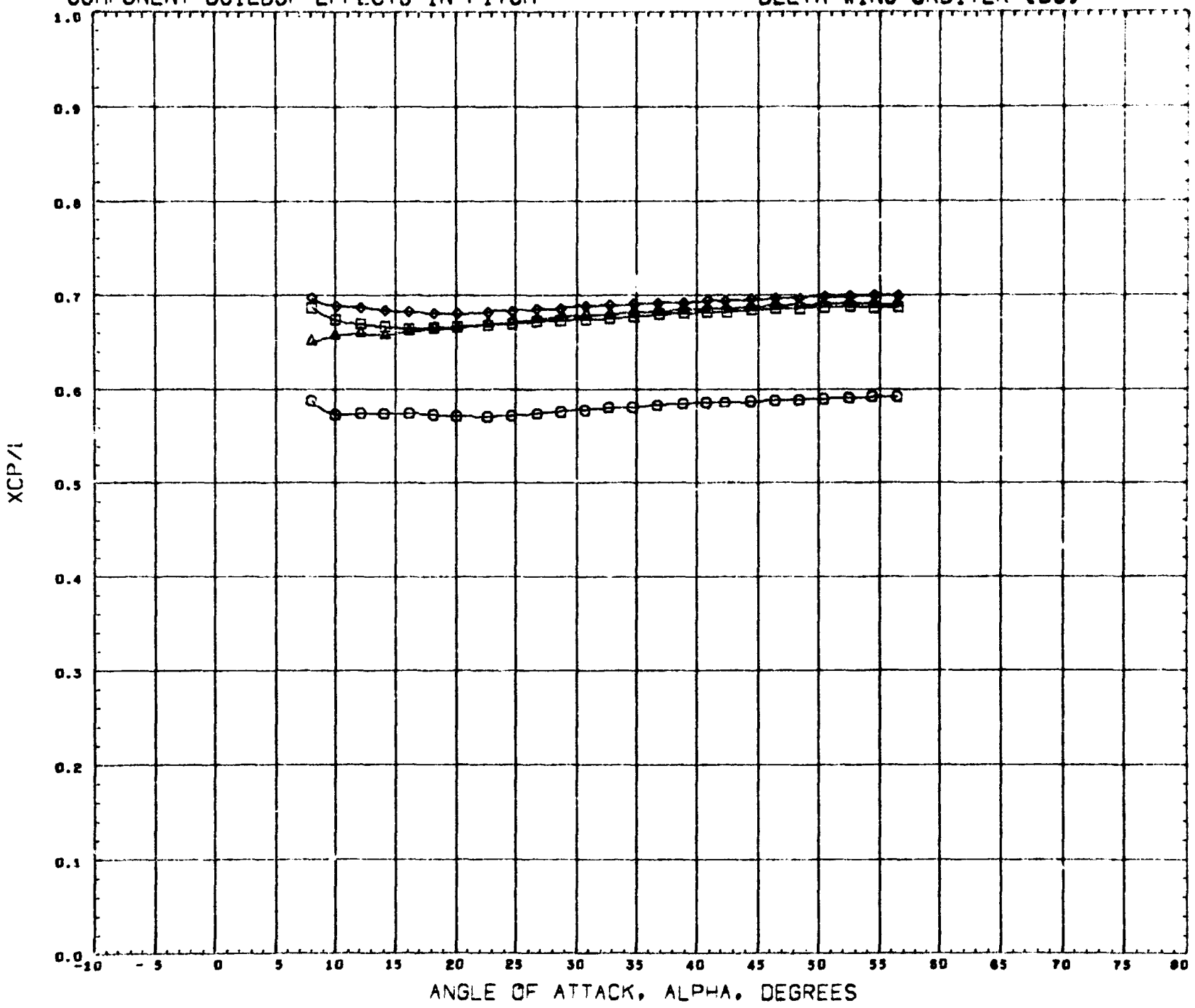
BETA 0.000

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.435	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

DELTA WING ORBITER (B5)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(F2101S)	○	MSFC 468 NR DELTA ORBITER B5
(F2102S)	□	MSFC 468 NR DELTA ORBITER B5W13E2
(F2103S)	◇	MSFC 468 NR DELTA ORBITER B5W14E3
(F2104S)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.959

PARAMETRIC VALUES

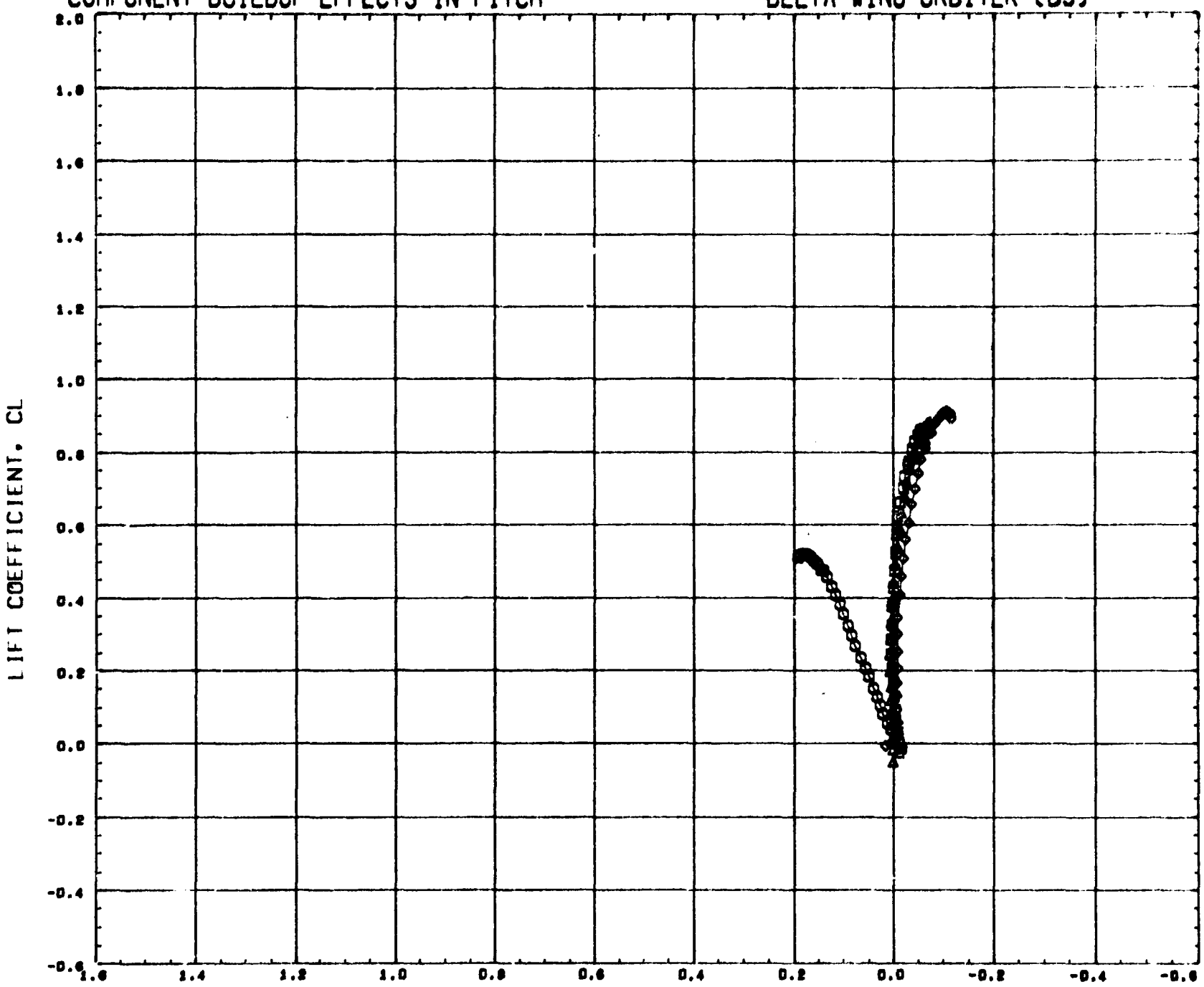
BETA 0.000

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

DELTA WING ORBITER (B5)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
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(821028)	□	MSFC 468 NR DELTA ORBITER B5W13E2
(821038)	◇	MSFC 468 NR DELTA ORBITER B5W14E3
(821048)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.959

PARAMETRIC VALUES

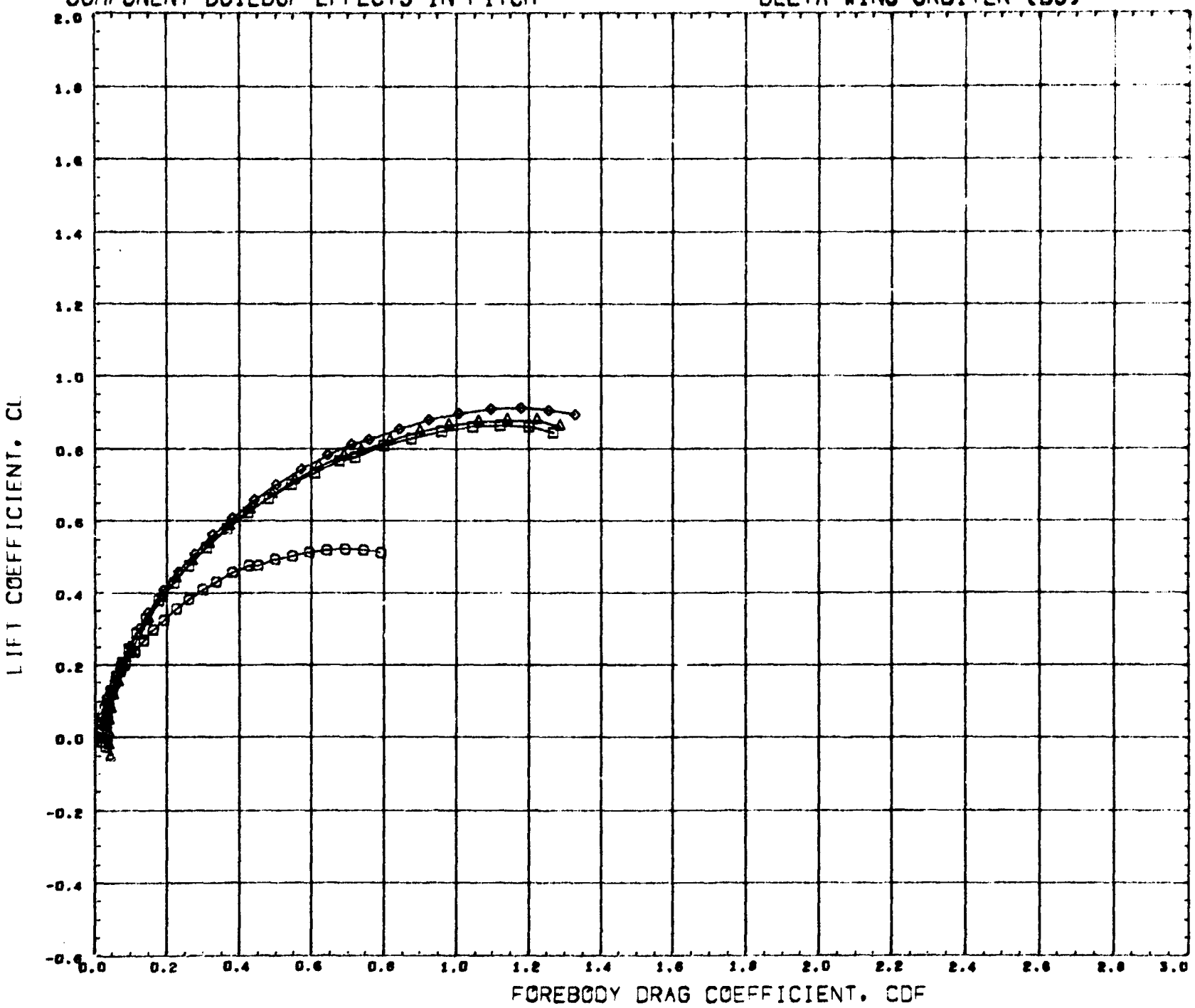
BETA 0.000

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT BUILDUP EFFECTS IN PITCH

DELTA WING ORBITER (B5)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
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(S21025)	□	MSFC 468 NR DELTA ORBITER B5W13E2
(S21035)	◇	MSFC 468 NR DELTA ORBITER B5W14E3
(S21045)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.959

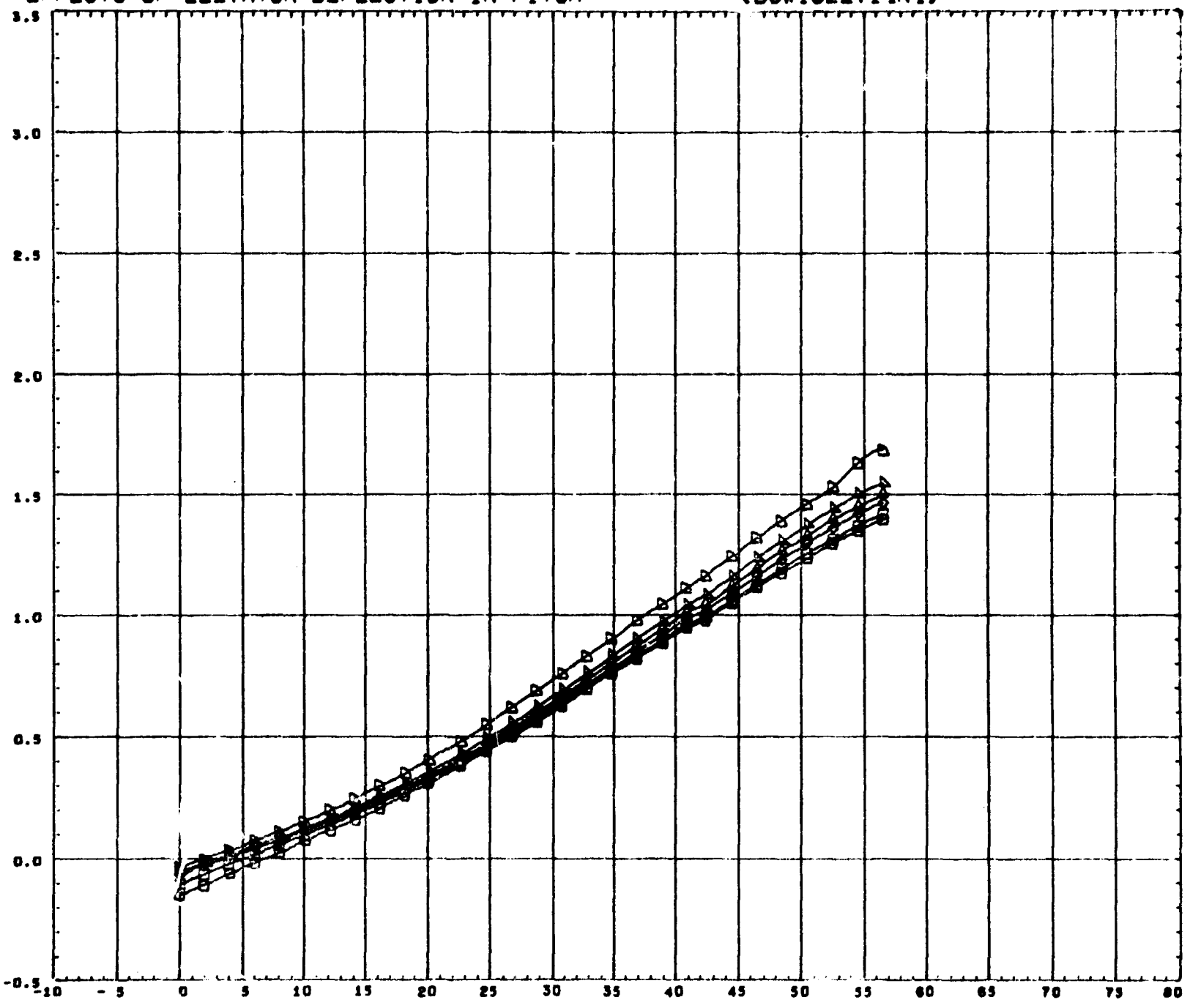
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

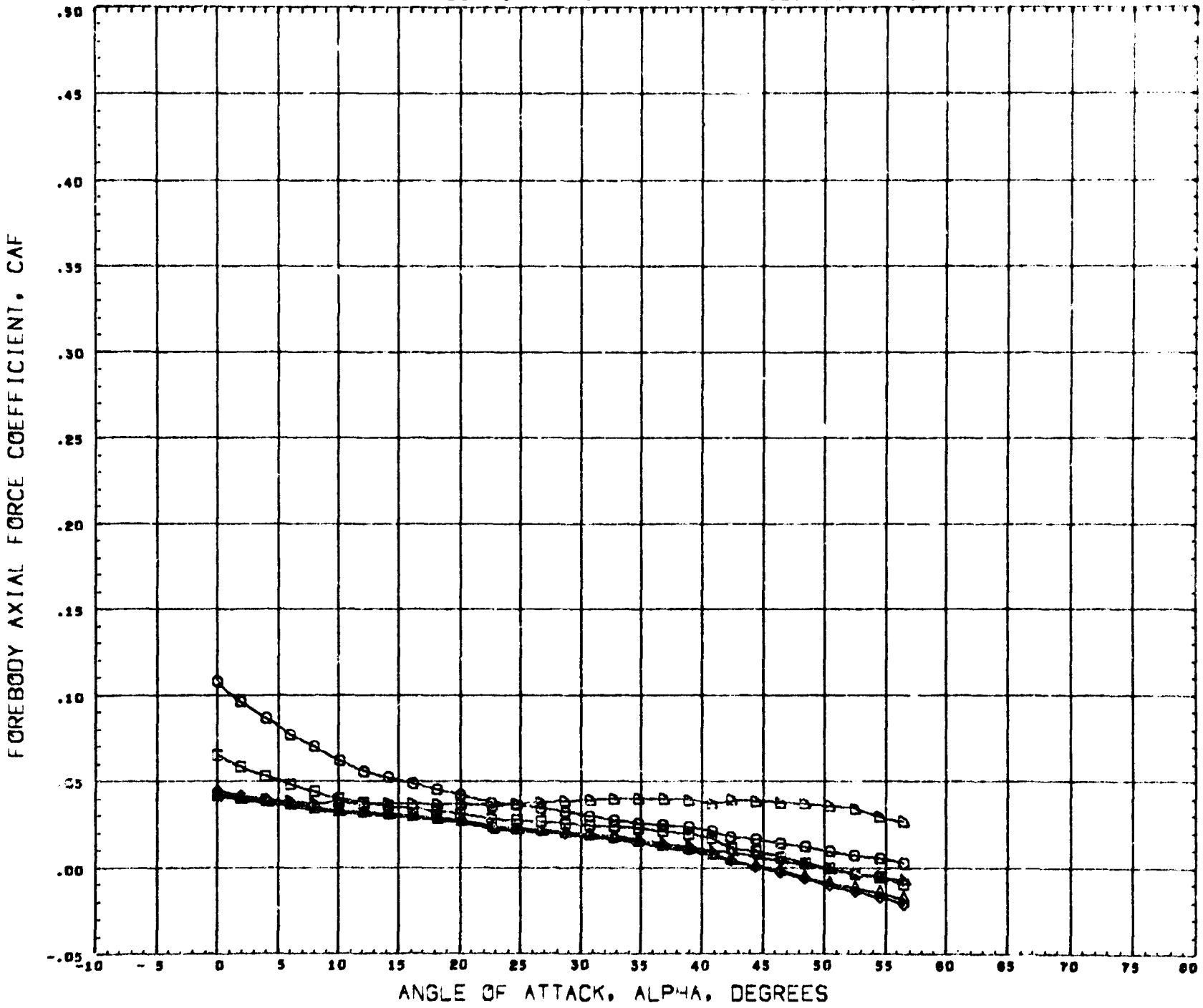
EFFECTS OF ELEVATOR DEFLECTION IN PITCH (B5W13E2V14R4)



SYMBOL	ELVATR		PARAMETRIC VALUES		
○	- 45.000	MACH	4.959	BETA	0.000
□	- 30.000	AILRON	0.000	RUDDER	0.000
◇	- 15.000	VRTICL	0.000		
△	- 7.500				
▷	0.000				
▷	15.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

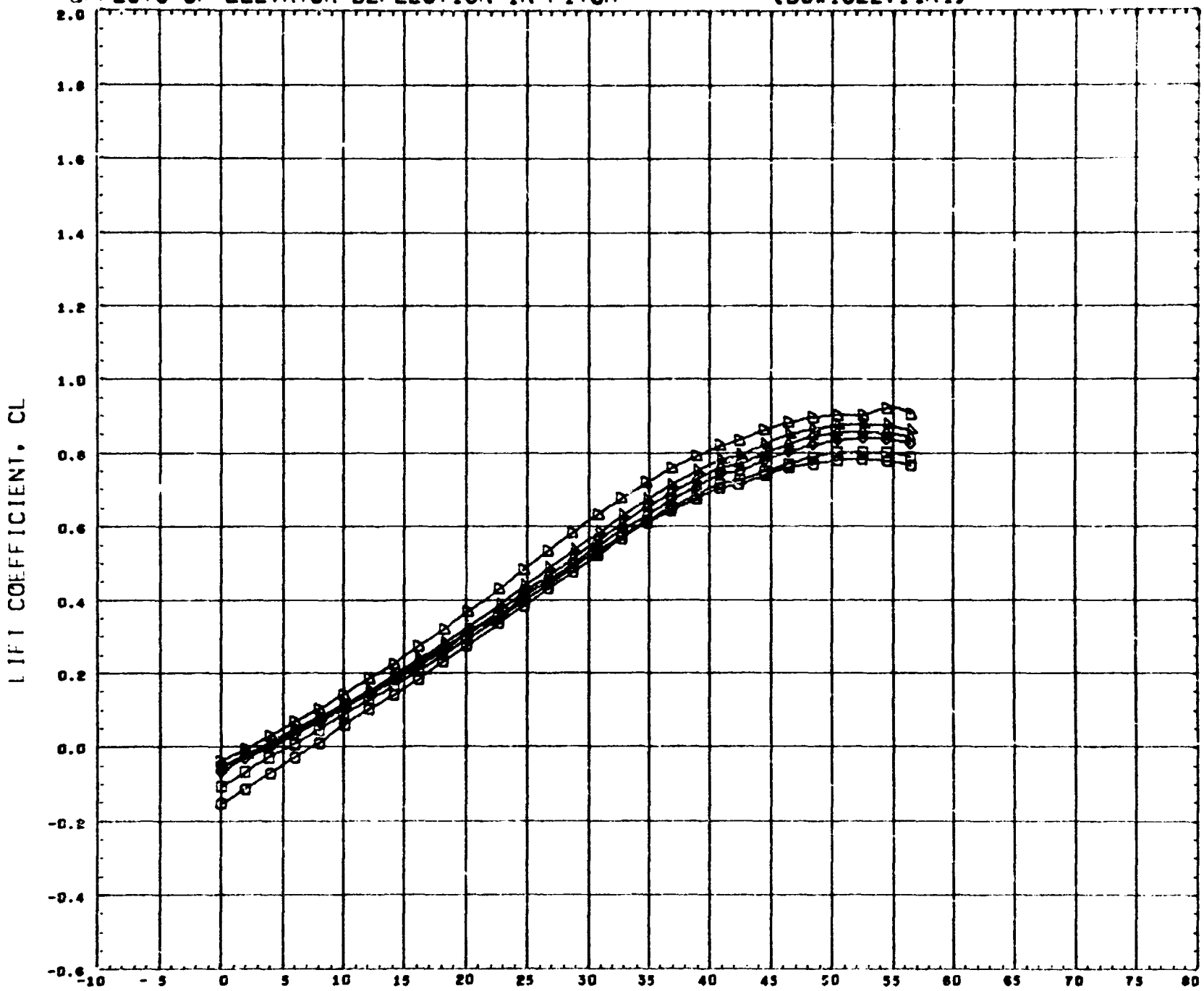
EFFECTS OF ELEVATOR DEFLECTION IN PITCH (B5W13E2V14R4)



SYMBOL	ELVATR		PARAMETRIC VALUES		
○	- 45.000	MACH	4.959	BETA	0.000
□	- 30.000	AILRON	0.000	RUDDER	0.000
◇	- 15.000	VRTICL	0.000		
△	- 7.500				
▷	0.000				
▷	15.000	REFERENCE FILE		NA 70 446	

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

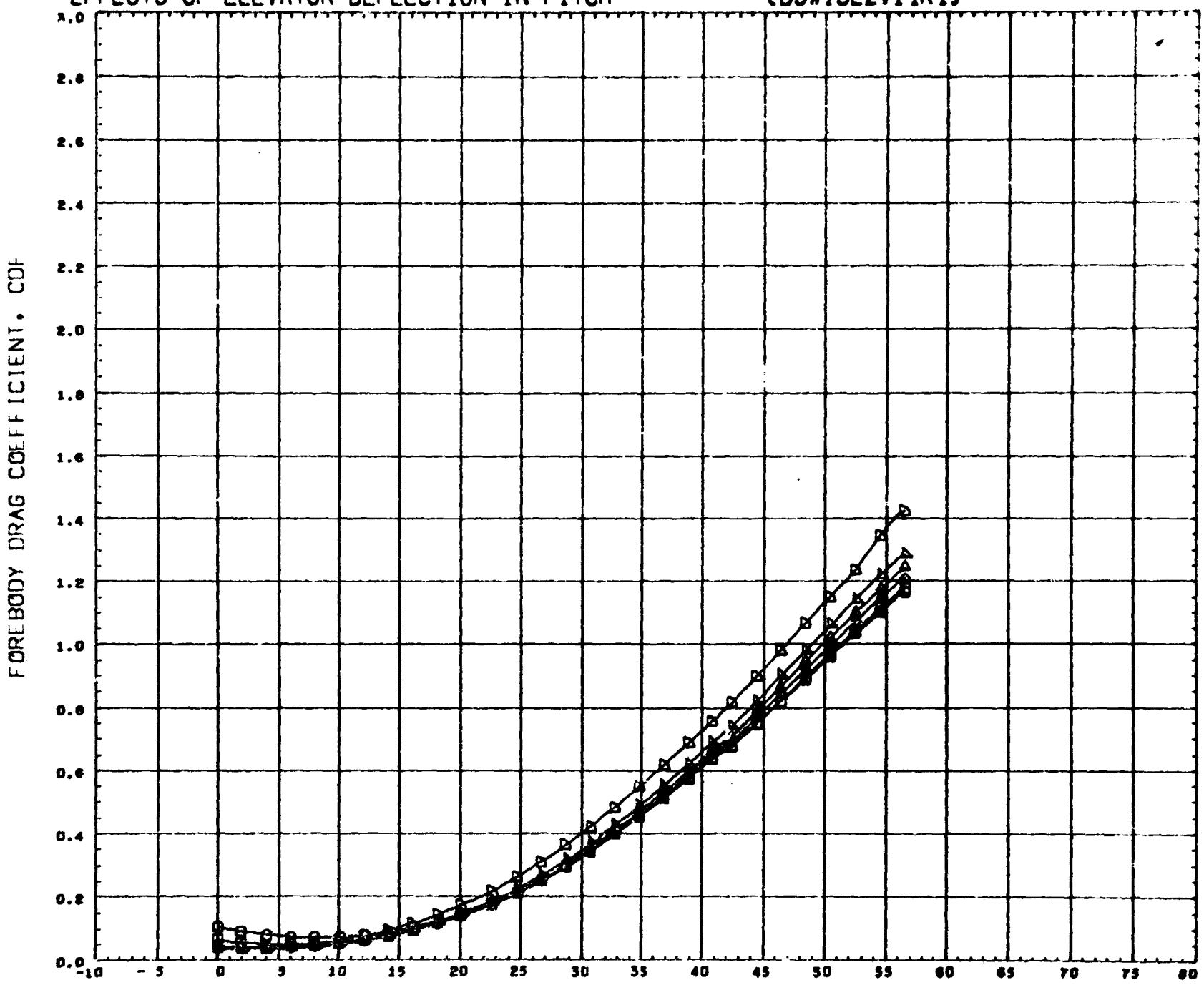
EFFECTS OF ELEVATOR DEFLECTION IN PITCH (B5W13E2V14R4)



SYMBOL	ELVATR		PARAMETRIC VALUES		
○	- 45.000	MACH	4.959	BETA	0.000
□	- 30.000	AILRON	0.000	RUDDER	0.000
◇	- 15.000	VRTICL	0.000		
△	- 7.500				
▽	0.000				
▷	15.000	REFERENCE FILE		NA 70 446	

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

EFFECTS OF ELEVATOR DEFLECTION IN PITCH (B5W13E2V14R4)

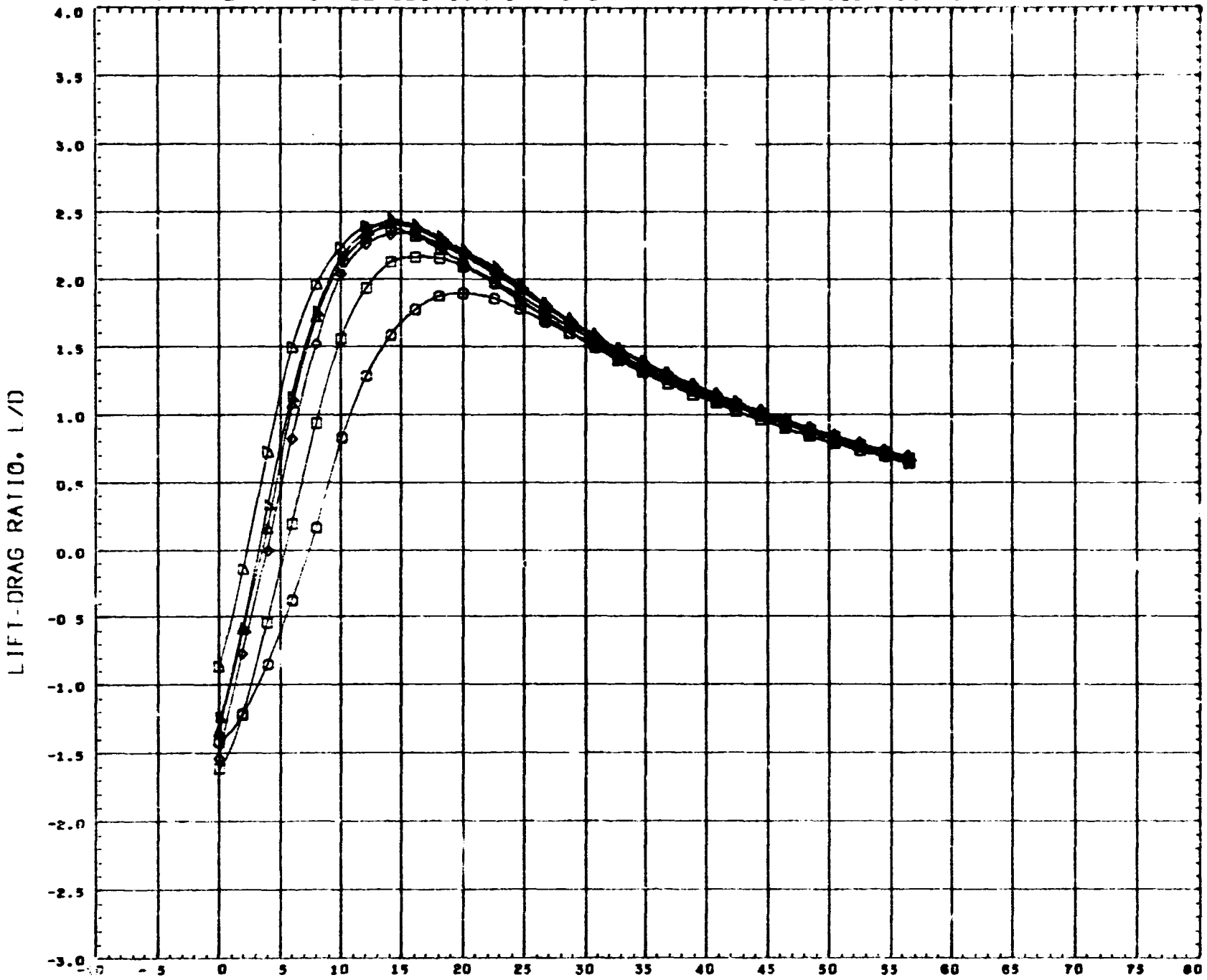


SYMBOL	ELVATR		PARAMETRIC VALUES		
○	-45.000	MACH	4.959	BETA	0.000
□	-30.000	AILRON	0.000	RUDDER	0.000
◇	-15.000	VRTICL	0.000		
△	-7.500				
▷	0.000				
▽	15.000	REFERENCE FILE		NA 70 446	

REFERENCE INFORMATION

REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9600	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

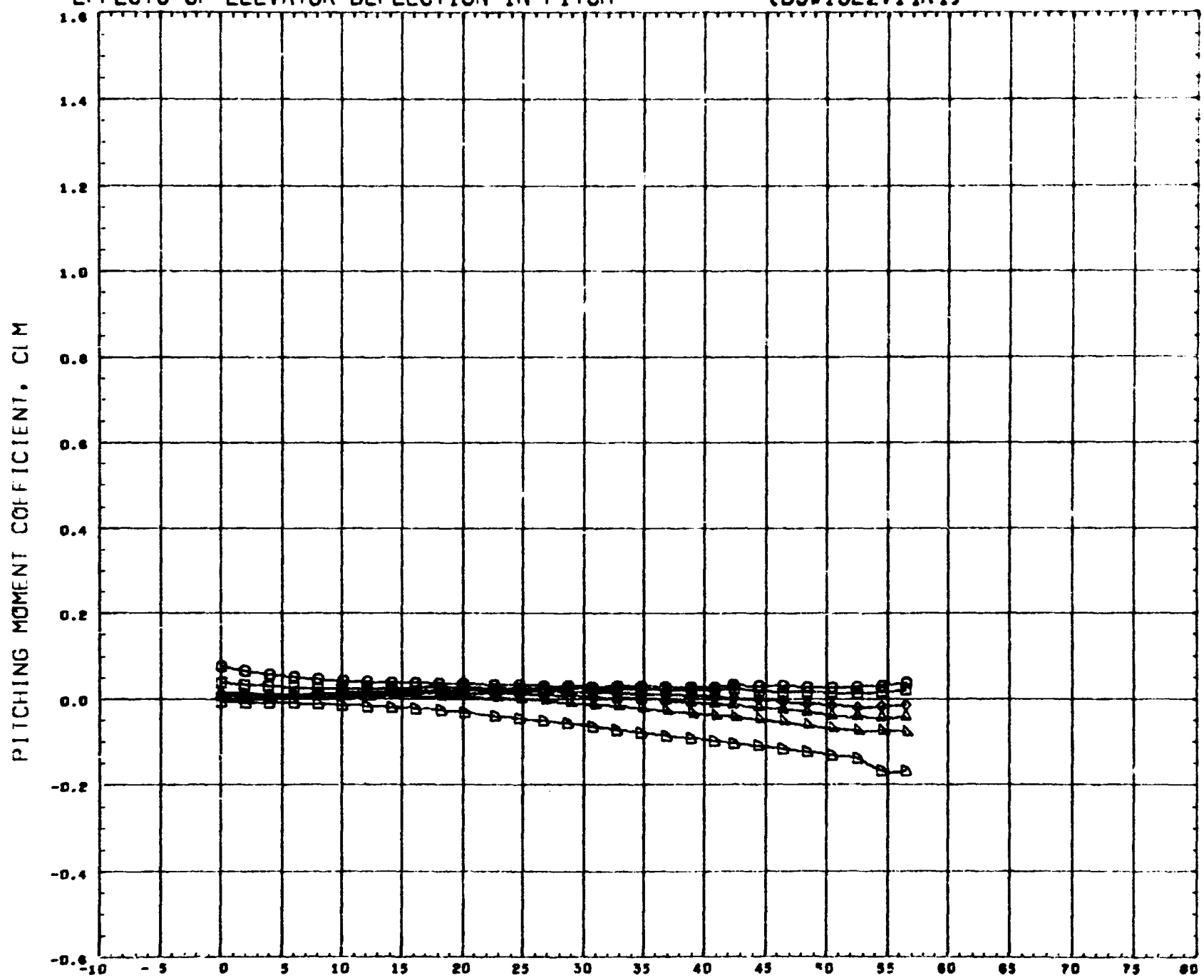
EFFECTS OF ELEVATOR DEFLECTION IN PITCH (B5W13E2V14R4)



SYMBOL	ELVATR		PARAMETRIC VALUES		
○	- 45.000	MACH	4.959	BETA	0.000
□	- 30.000	AILRON	0.000	RUDDER	0.000
◇	- 15.000	VRTICL	0.000		
△	- 7.500				
▷	0.000				
⊃	15.000	REFERENCE FILE		NA 70 446	

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

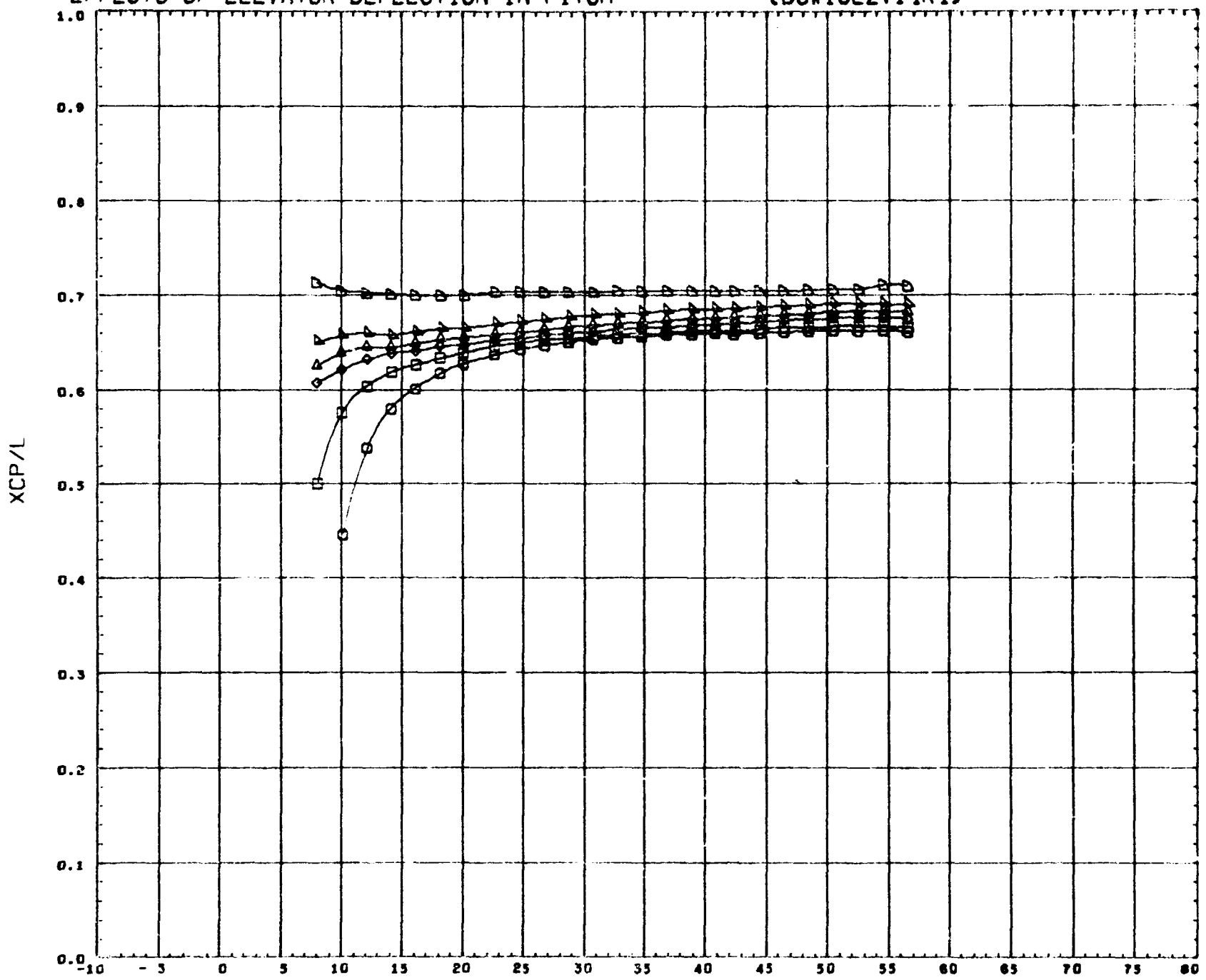
EFFECTS OF ELEVATOR DEFLECTION IN PITCH (B5W13E2V14R4)



SYMBOL	ELVATR		PARAMETRIC VALUES		
○	- 45.000	MACH	4.959	BETA	0.000
□	- 30.000	AILRON	0.000	RUDDER	0.000
◇	- 15.000	VRTICL	0.000		
△	- 7.500				
▽	0.000				
▷	15.000	REFERENCE FILE		NA 70 446	

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

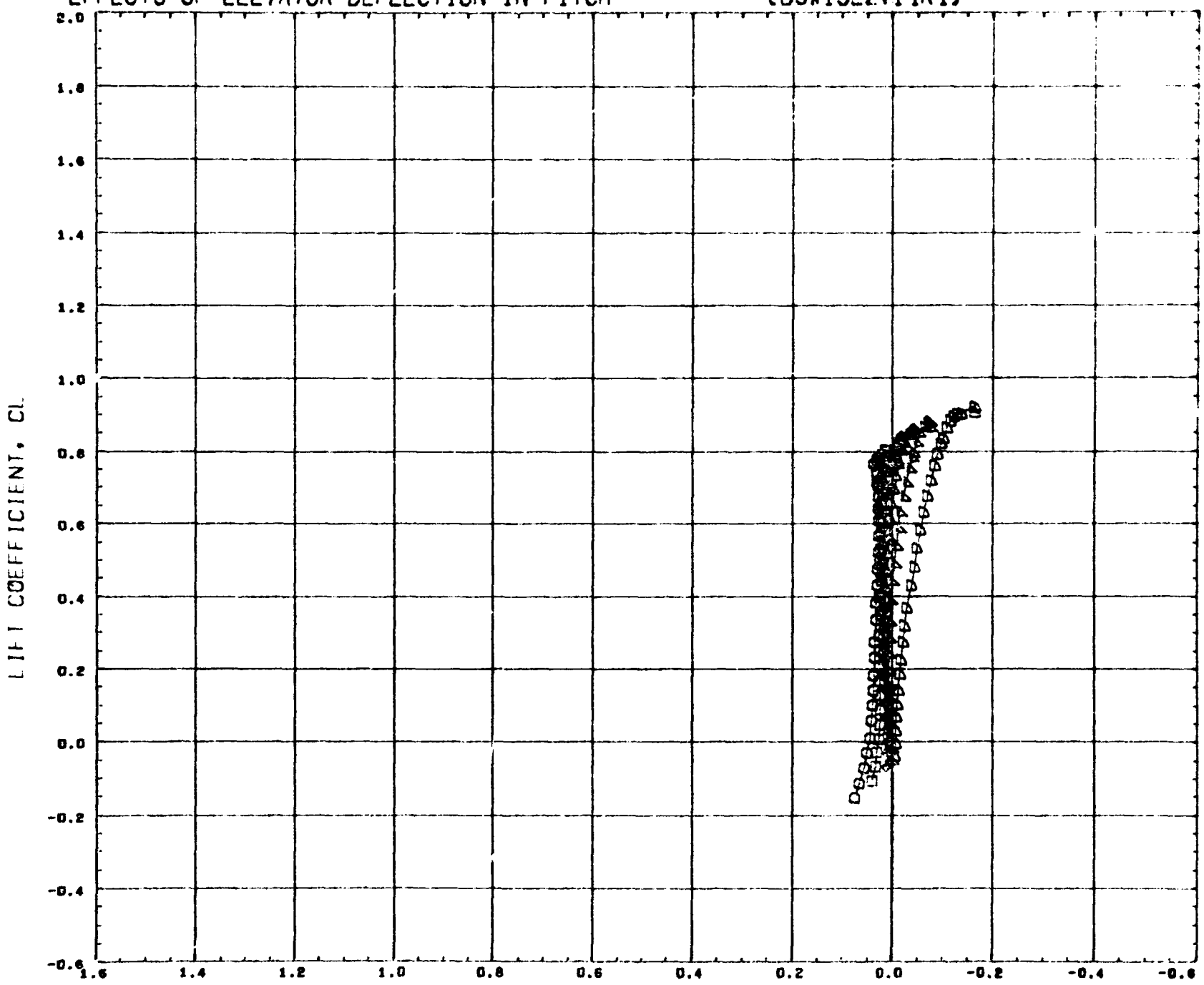
EFFECTS OF ELEVATOR DEFLECTION IN PITCH (B5W13E2V14R4)



SYMBOL	ELVATR		PARAMETRIC VALUES		
○	- 45.000	MACH	4.959	BETA	0.000
□	- 30.000	AILRON	0.000	RUDDER	0.000
◇	- 15.000	VRTICL	0.000		
△	- 7.500				
▷	0.000				
⊃	15.000	DATA HIST. CODE	*G		

REFERENCE INFORMATION		
REFS	10 7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

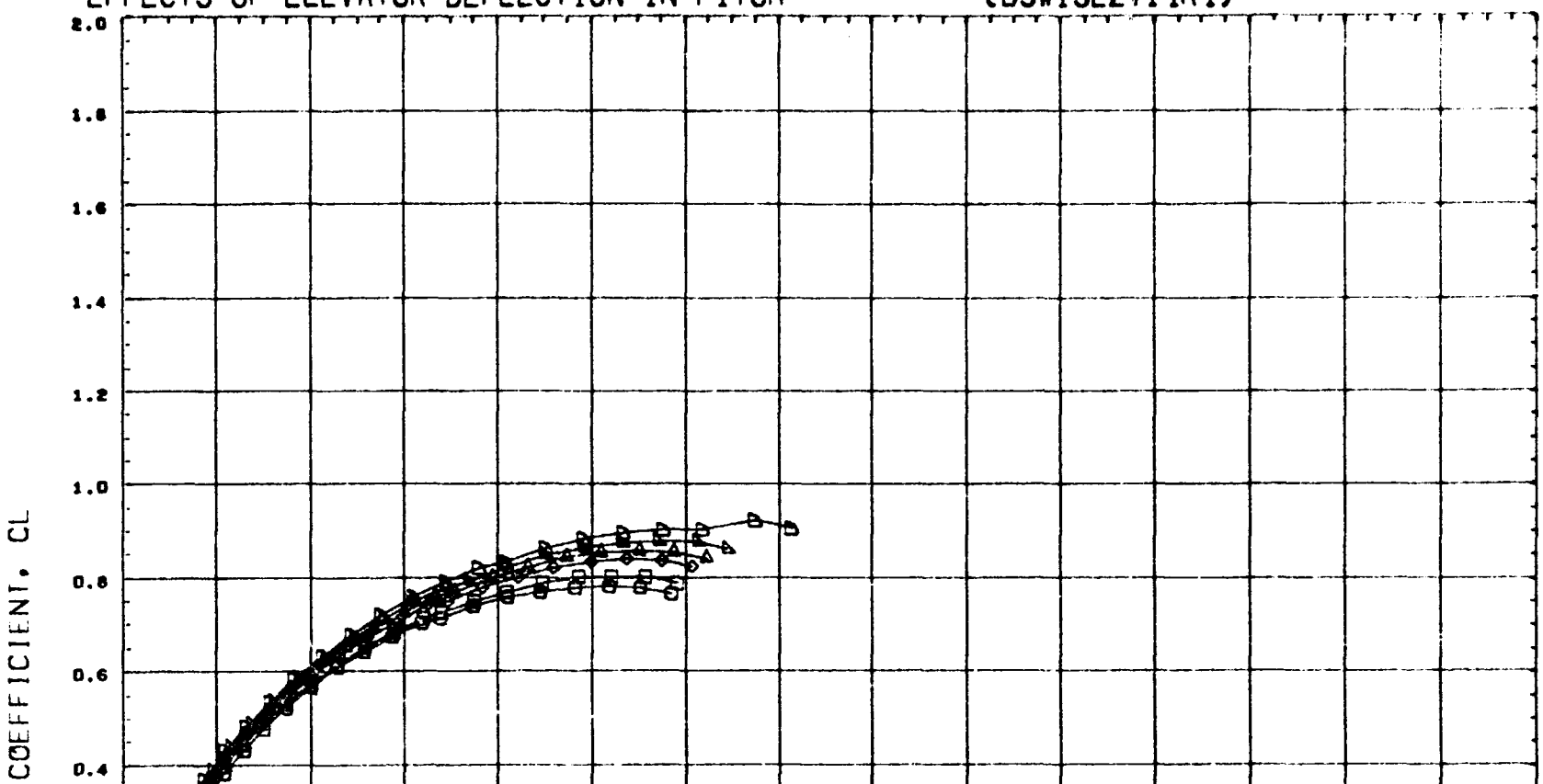
EFFECTS OF ELEVATOR DEFLECTION IN PITCH (B5W13E2V14R4)



SYMBOL	ELVATR		PARAMETRIC VALUES		
O	- 45.000	MACH	4.959	BETA	0.000
□	- 30.000	AILRON	0.000	RUDDER	0.000
◇	- 15.000	VRTICL	0.000		
Δ	- 7.500				
▽	0.000				
D	15.000	REFERENCE FILE		NA 70 446	

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

EFFECTS OF ELEVATOR DEFLECTION IN PITCH (B5W13E2V14R4)

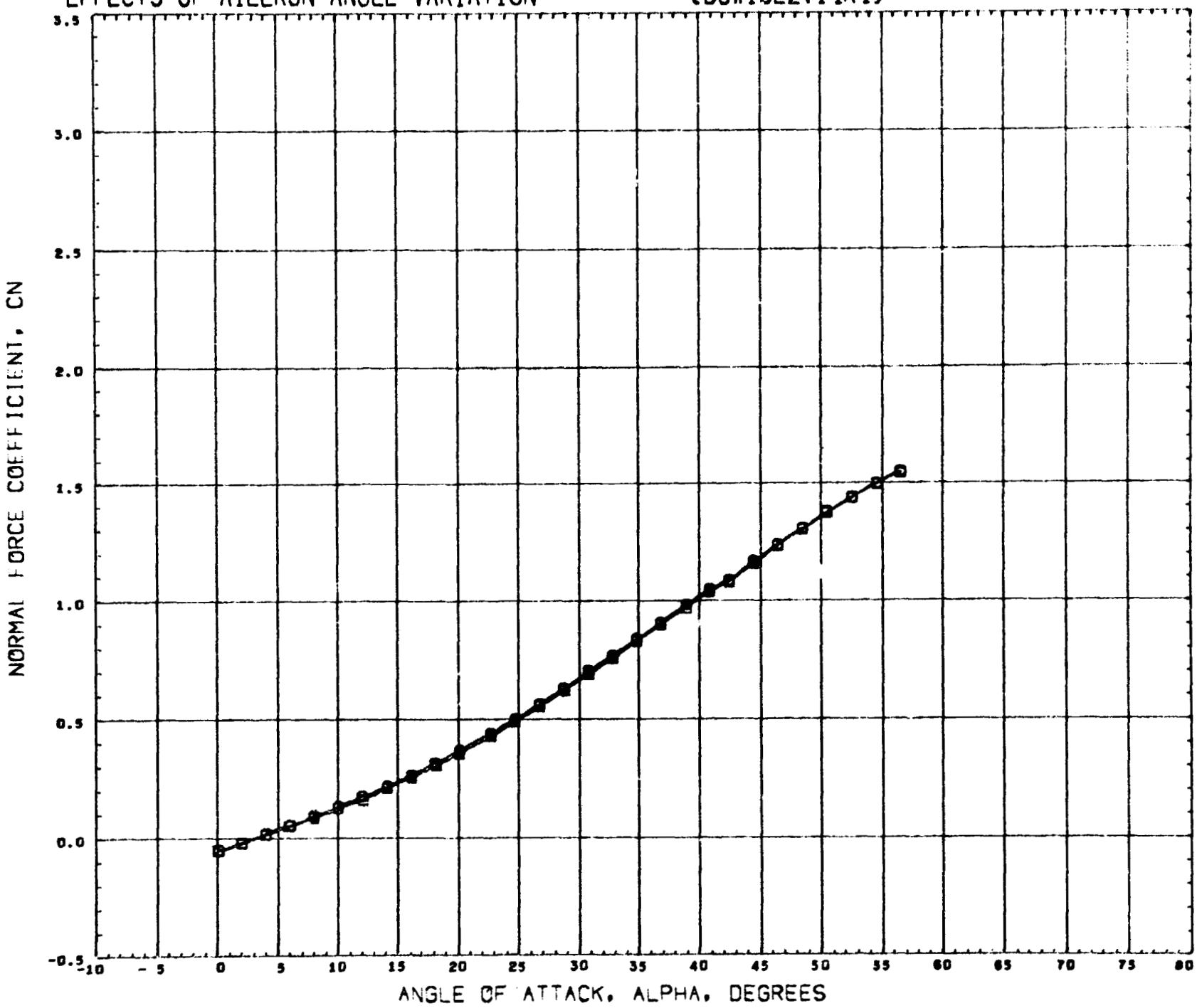


SYMBOL	ELVATR		PARAMETRIC VALUES		
O	- 45.000	MACH	4.959	BETA	0.000
□	- 30.000	AILRON	0.000	RUDDER	0.000
◇	- 15.000	VRTICL	0.000		
△	- 7.500				
⊿	0.000				
D	15.000	REFERENCE FILE		NA 70 446	

REFERENCE INFORMATION

REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)



SYMBOL	AILRON
□	- 15.000
□	0.000

PARAMETRIC VALUES

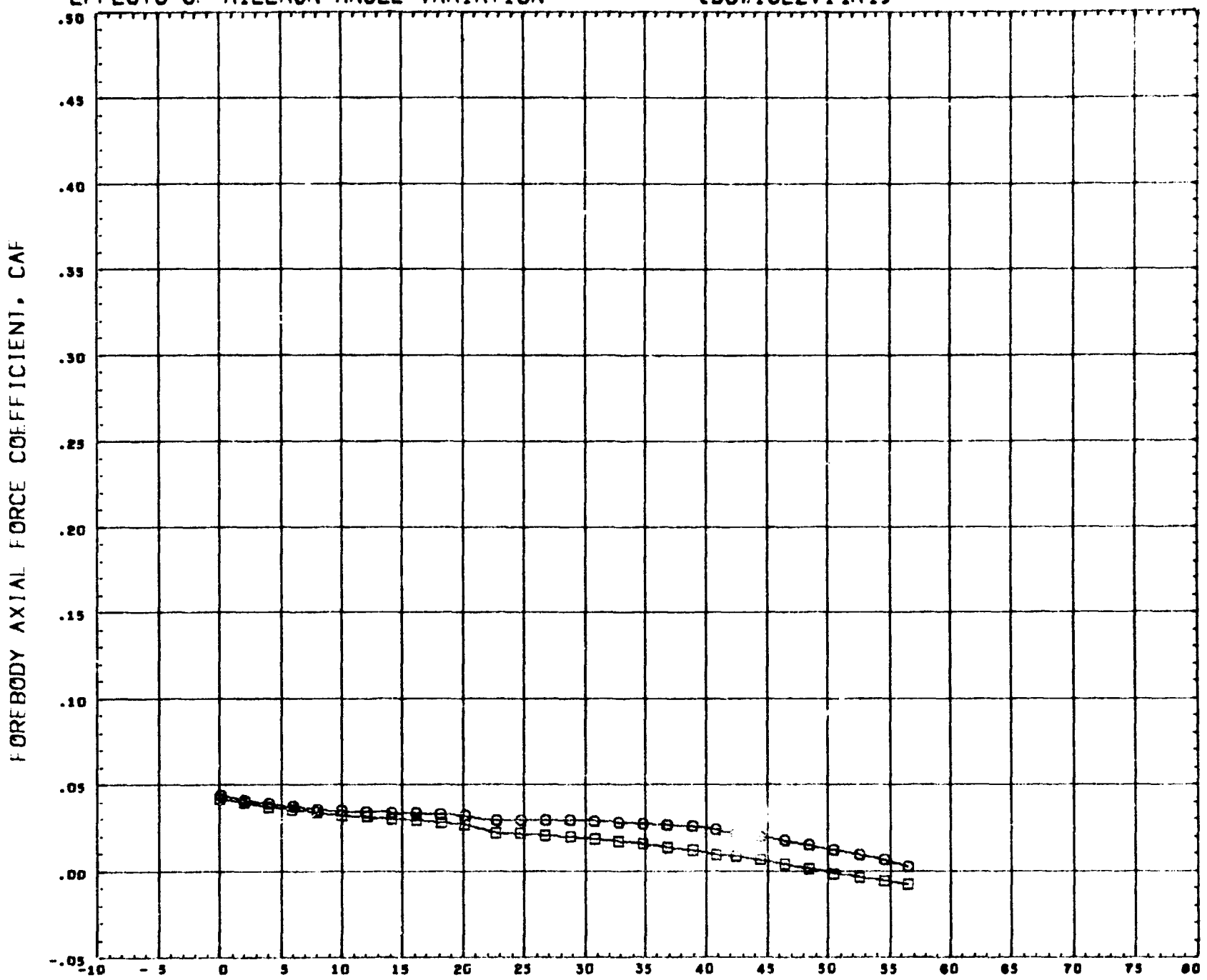
MACH	4.959	BETA	0.000
ELVATR	0.000	RUDDER	0.000
VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION

REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9600	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)

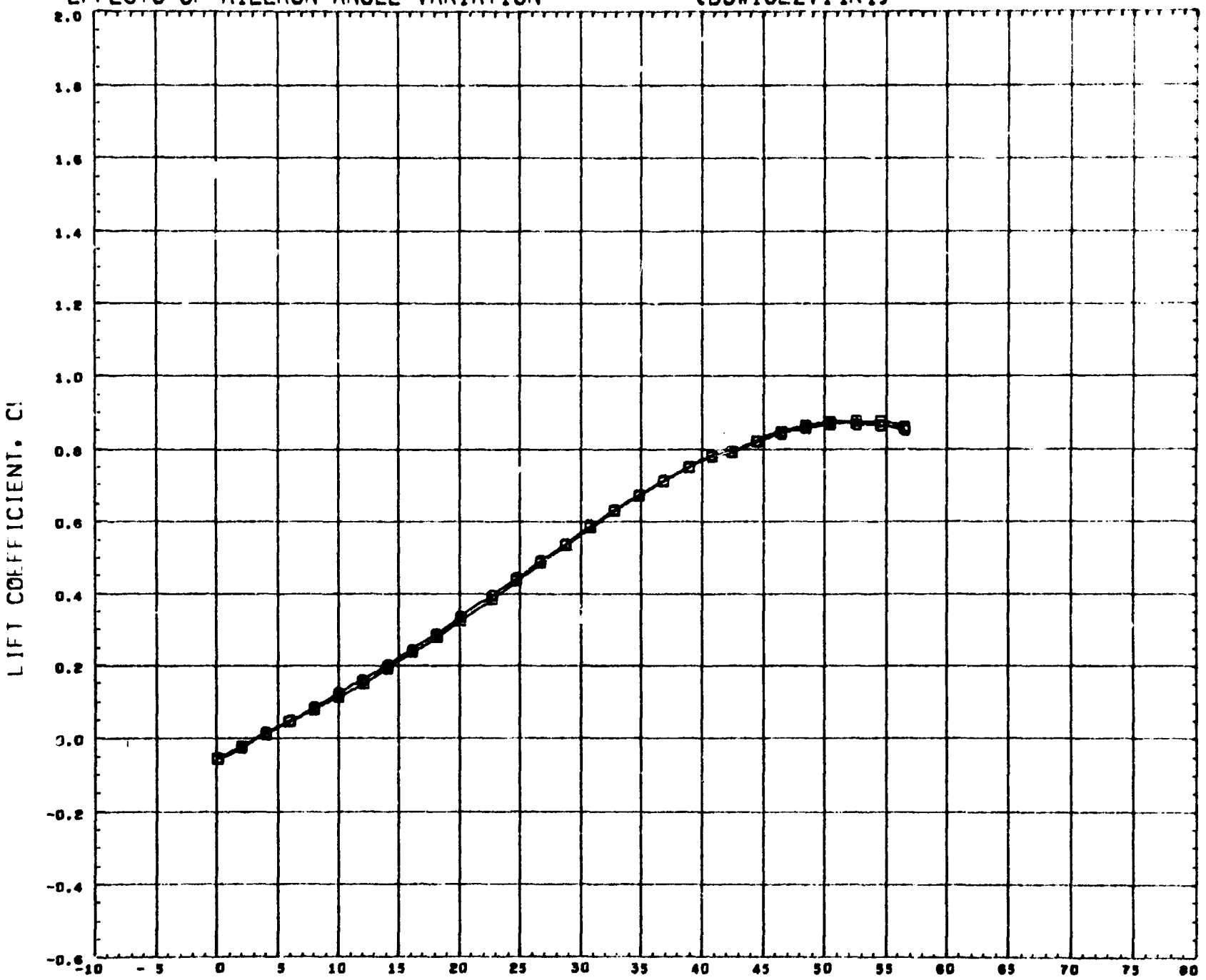


SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	4.959	BETA	0.000
□	0.000	ELVATR	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)

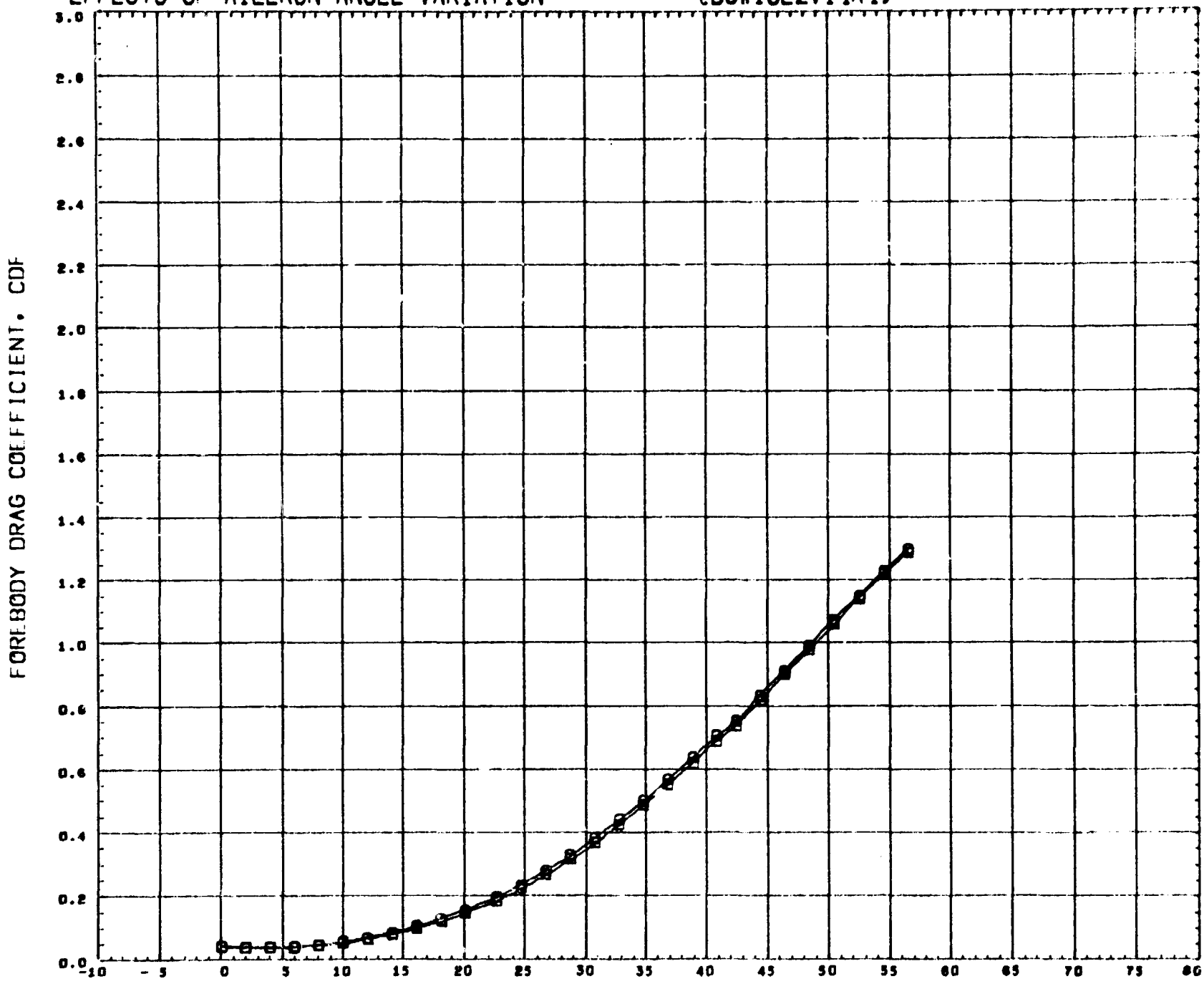


SYMBOL	AILRON	PARAMETRIC VALUES			
□	- 15.000	MACH	4.959	BETA	0.000
□	0.000	ELVATR	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)

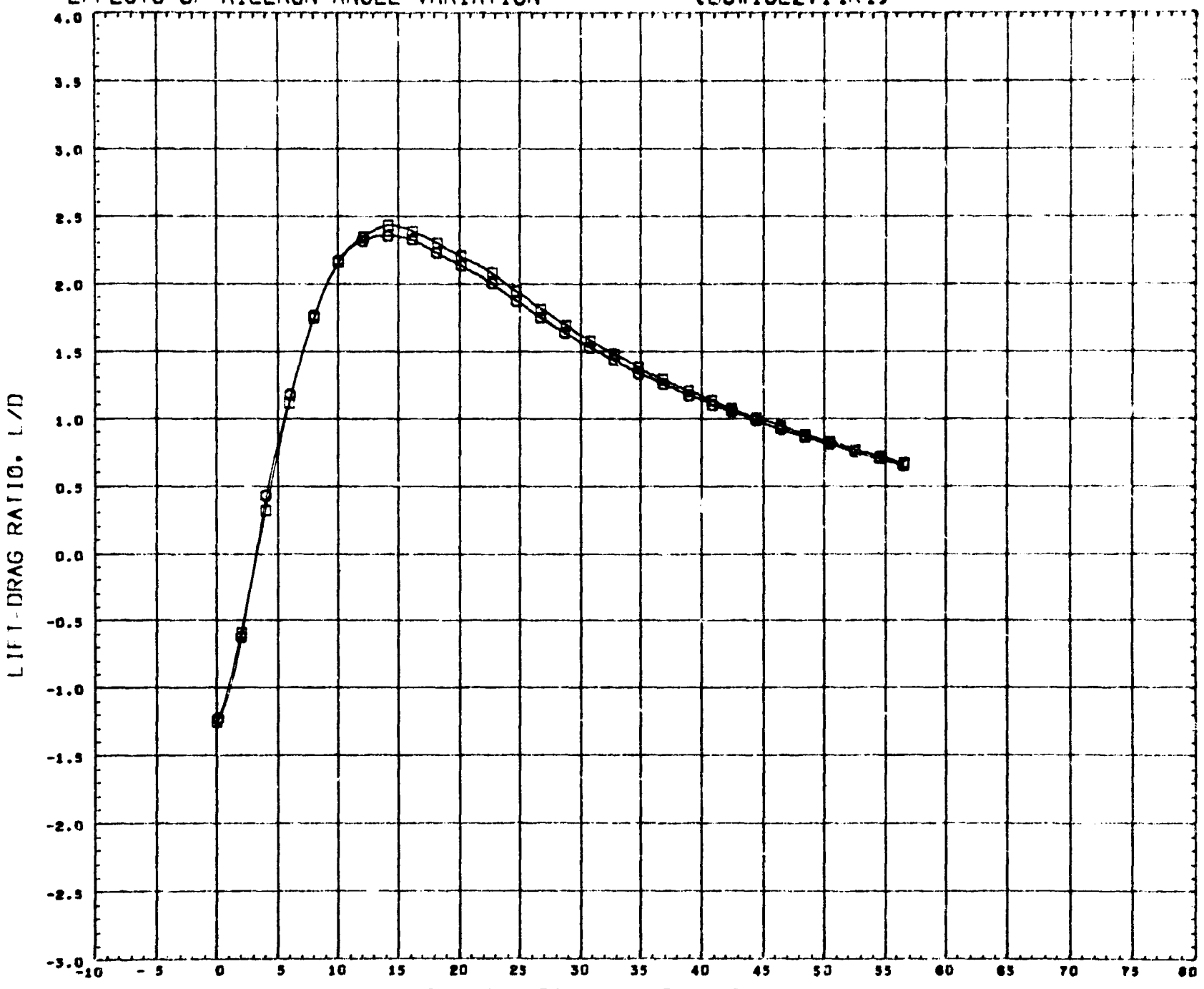


SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	4.959	BETA	0.000
□	0.000	ELVATR	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)



SYMBOL	AILRON		PARAMETRIC VALUES		
O	- 15.000	MACH	4.959	BETA	0.000
□	0.000	ELVATR	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
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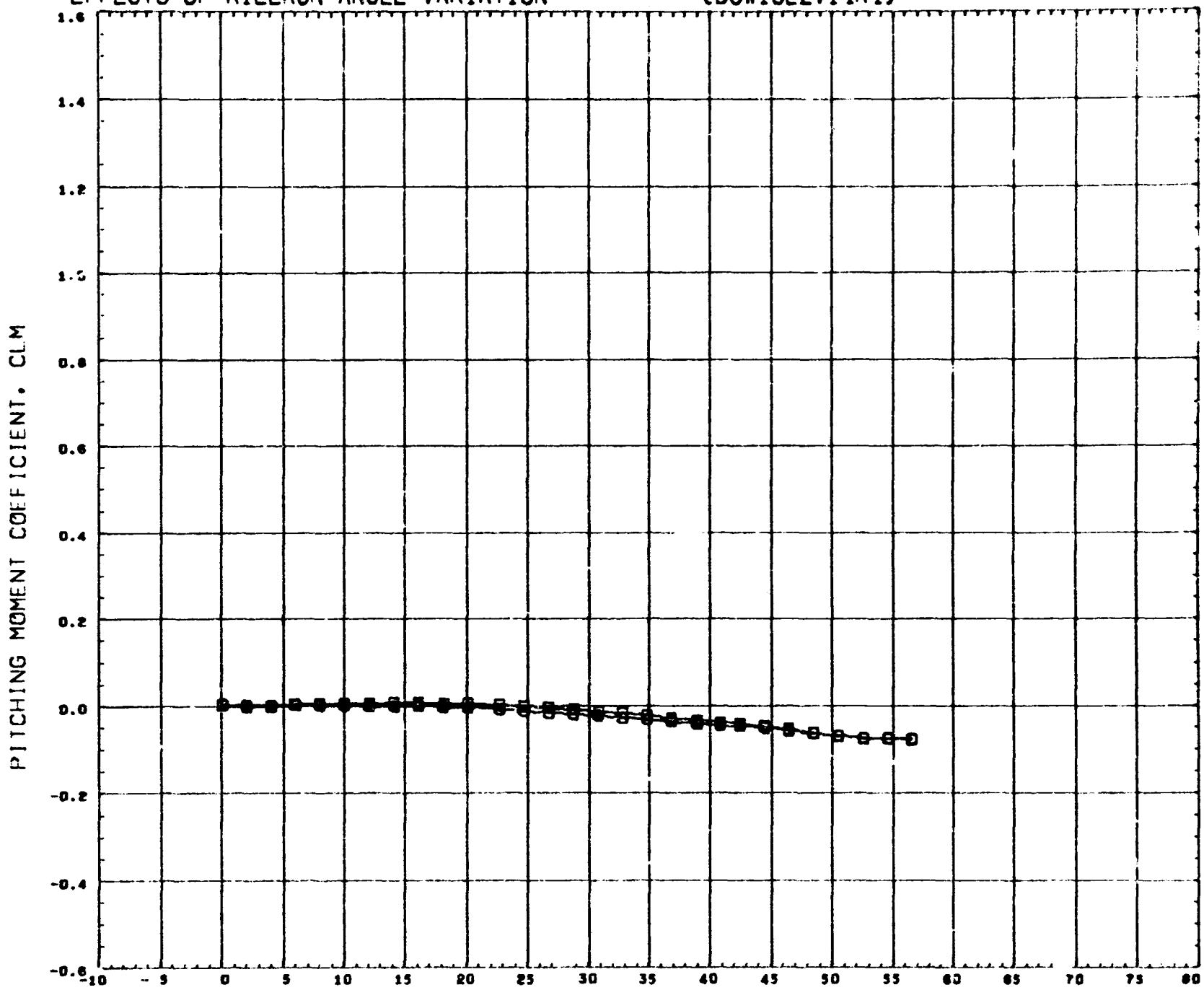
SCALE	0.0035	SCALE

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)



SYMBOL	AILRON	PARAMETRIC VALUES			
O	-15.000	MACH	4.959	BETA	0.000
□	0.000	ELVATR	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.6740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
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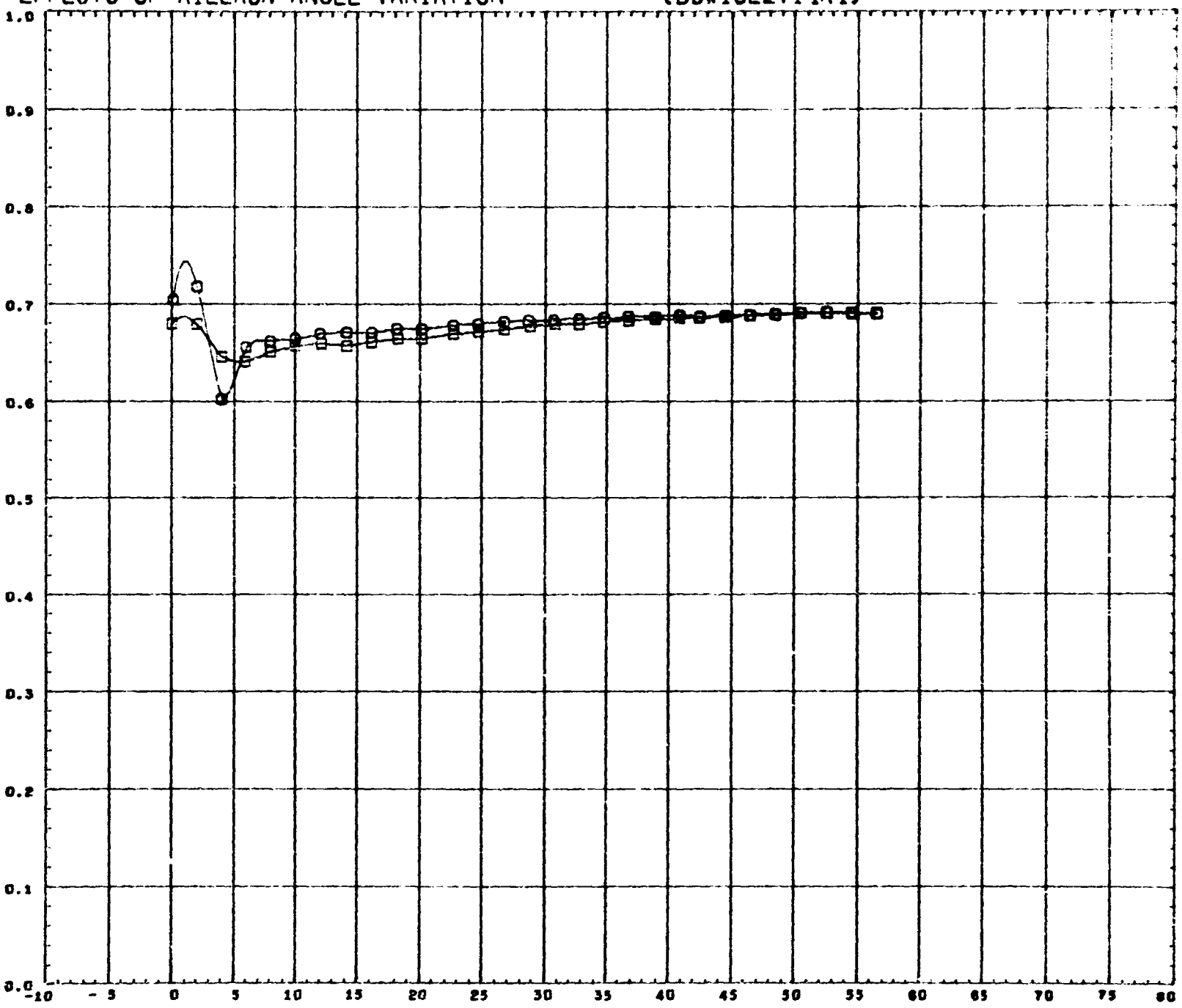
SCALE	0.0035	SCALE

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)



SYMBOL	AILRON	PARAMETRIC VALUES			
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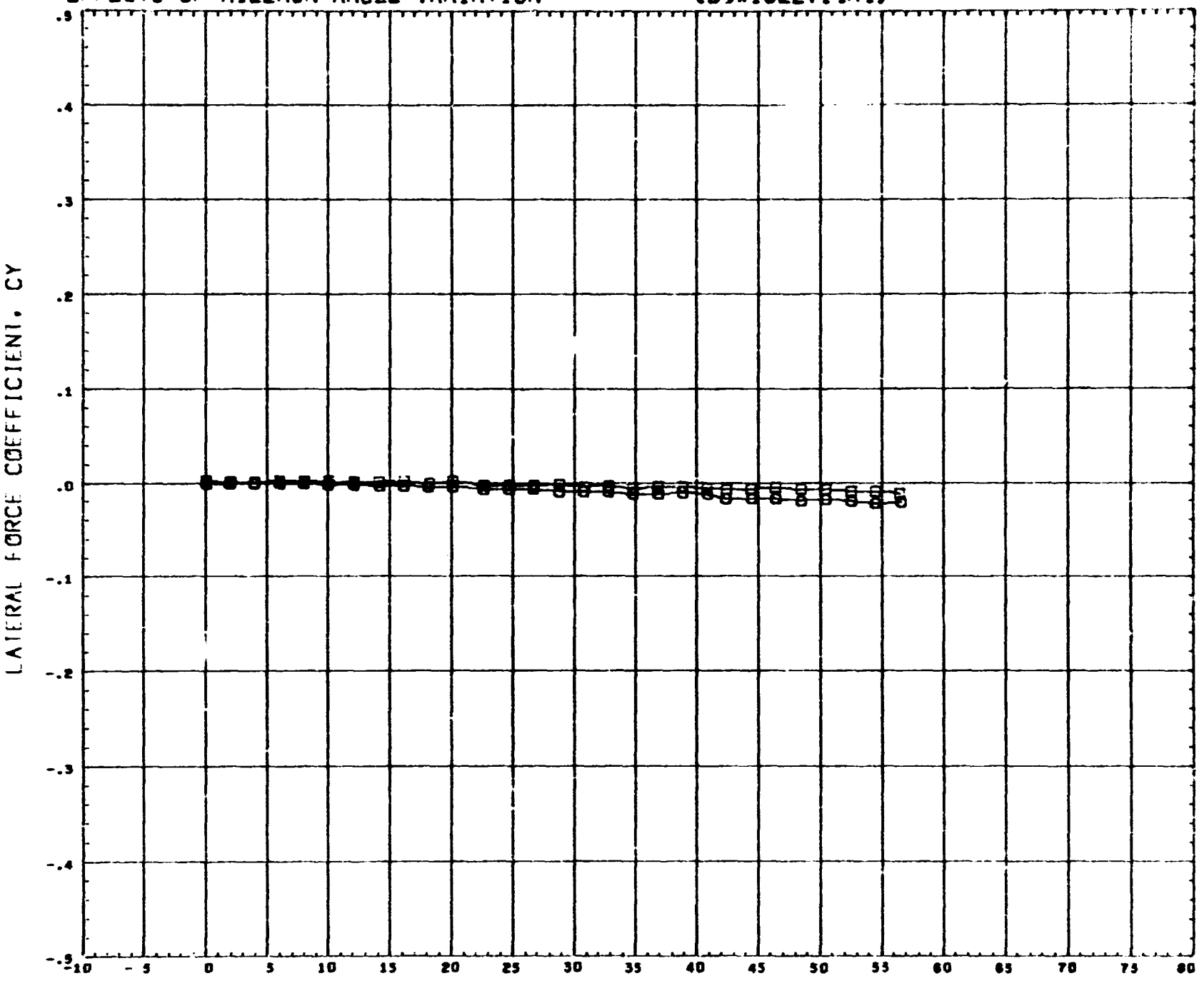
□	0.000	ELVATR	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4350	INCHES
SCALE	0.0035	SCALE

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)

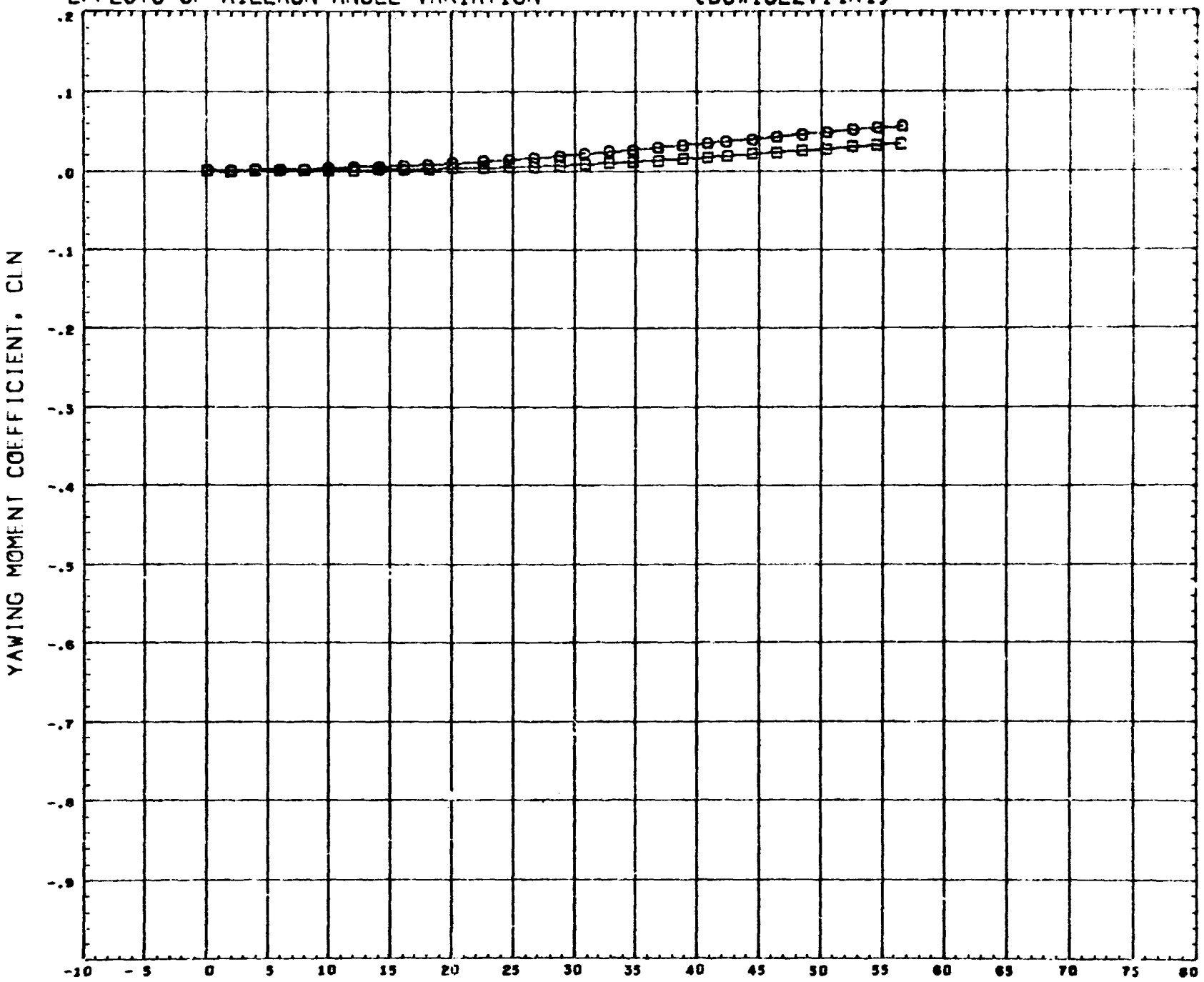


SYMBOL	AILRON		PARAMETRIC VALUES		
O	-15.000	MACH	4.959	BETA	0.000
□	0.000	ELVATR	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9500	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)

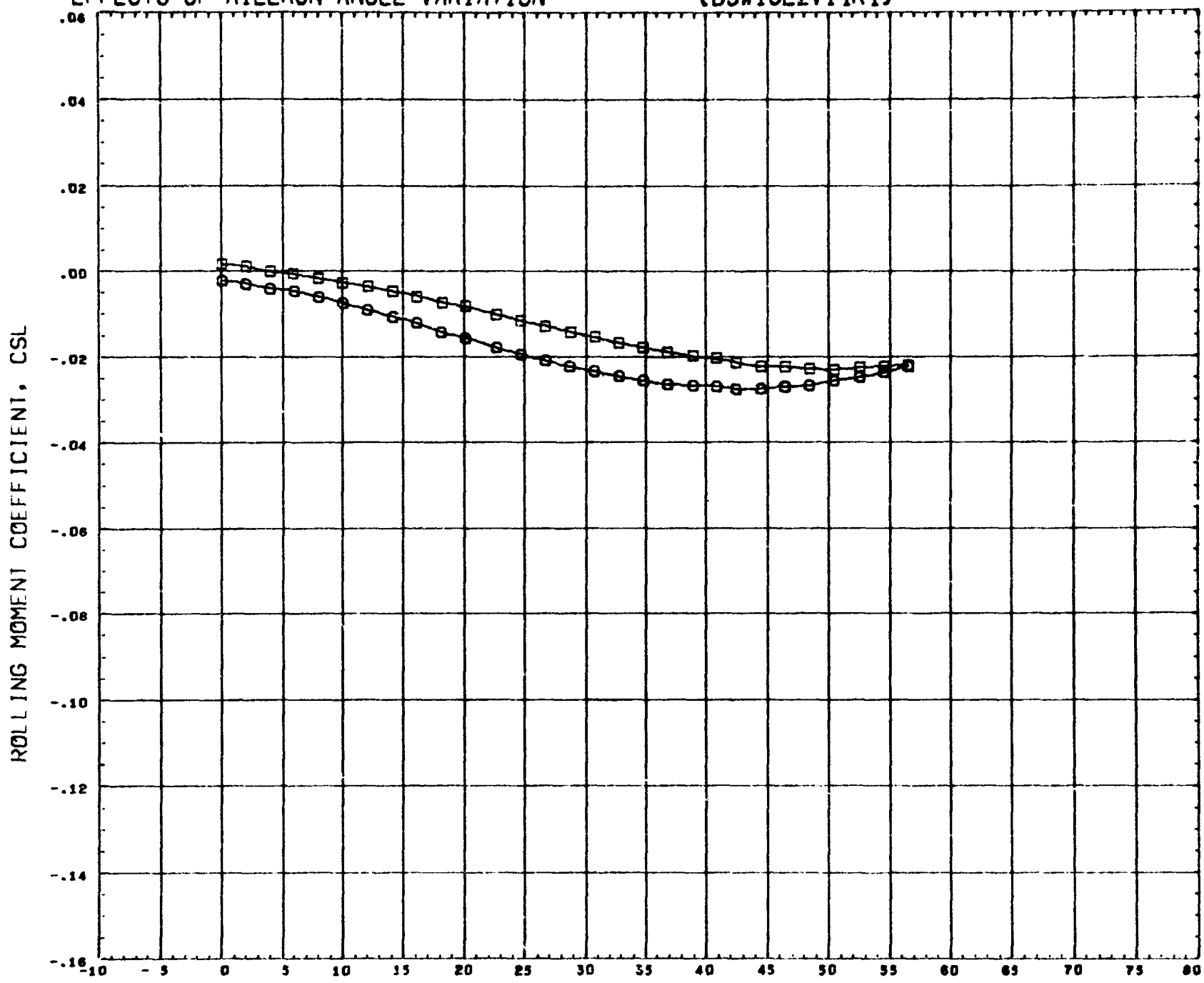


SYMBOL	AILRON		PARAMETRIC VALUES		
O	-15.000	MACH	4.959	BETA	0.000
□	0.000	ELVATR	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)

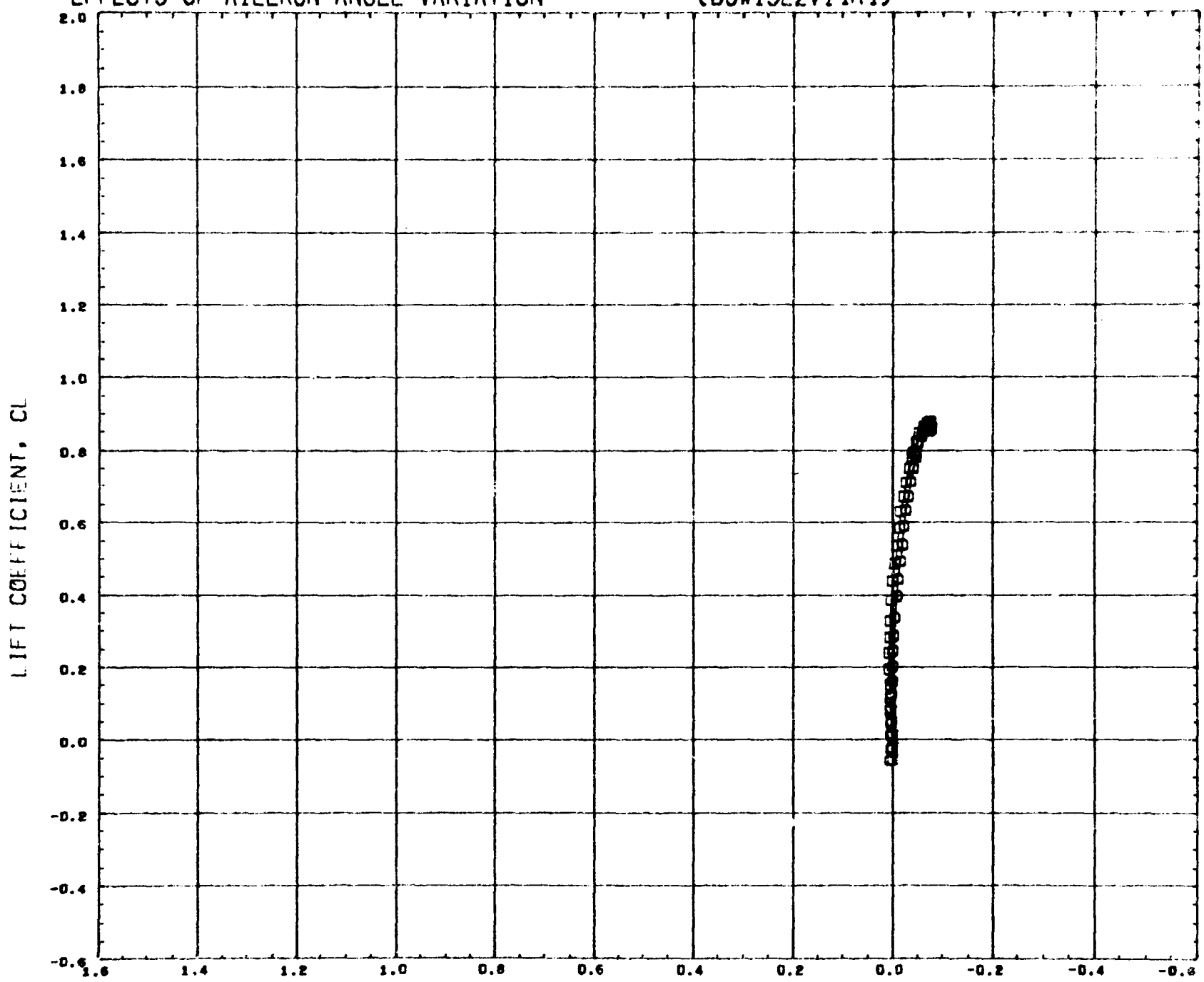


SYMBOL	AILRON	PARAMETRIC VALUES			
O	- 15.000	MACH	4.959	BETA	0.000
□	0.000	ELVATR	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)

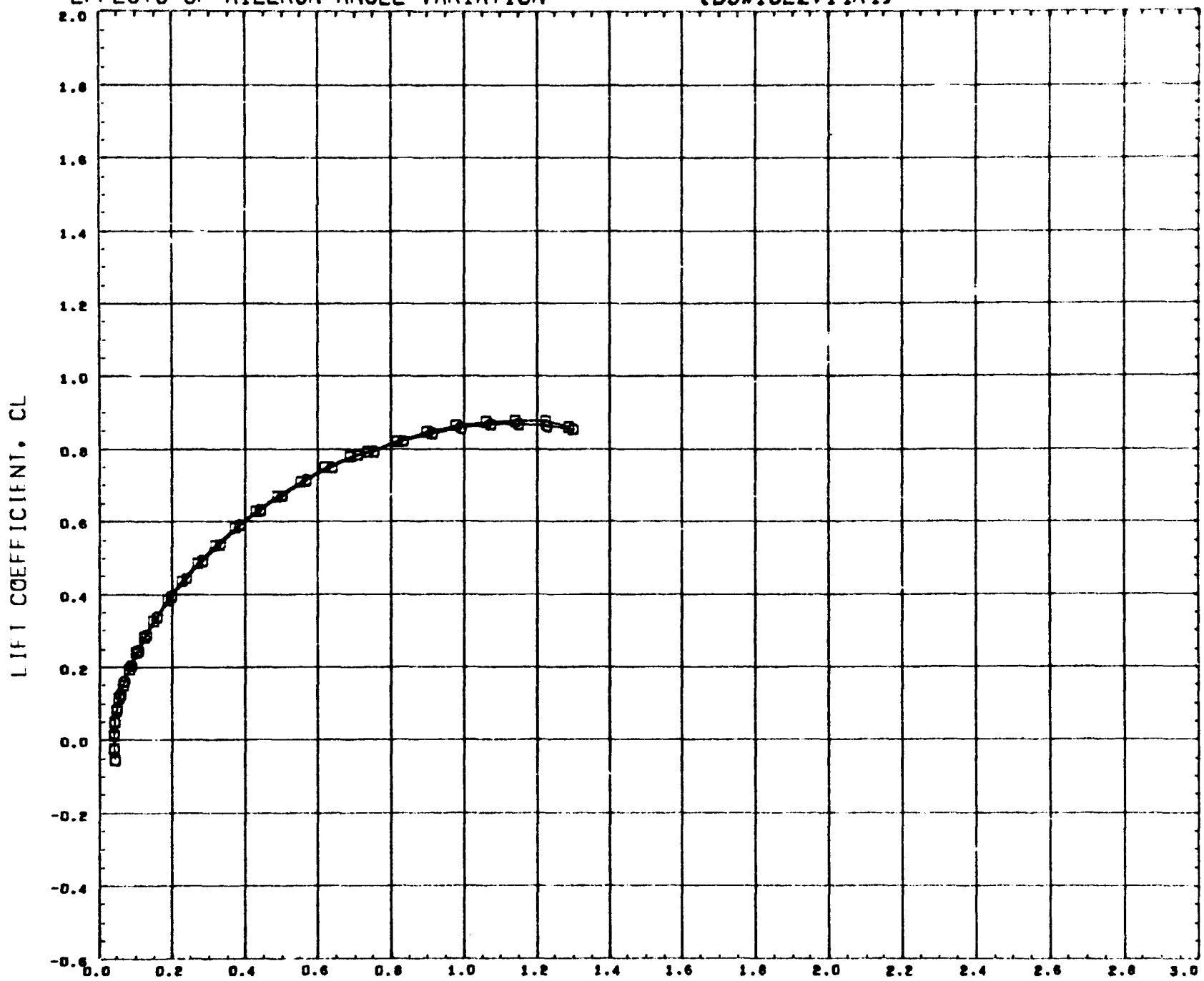


SYMBOL	AILRON		PARAMETRIC VALUES		
□	- 15.000	MACH	4.959	BETA	0.000
○	0.000	ELVATR	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

EFFECTS OF AILERON ANGLE VARIATION (B5W13E2V14R4)

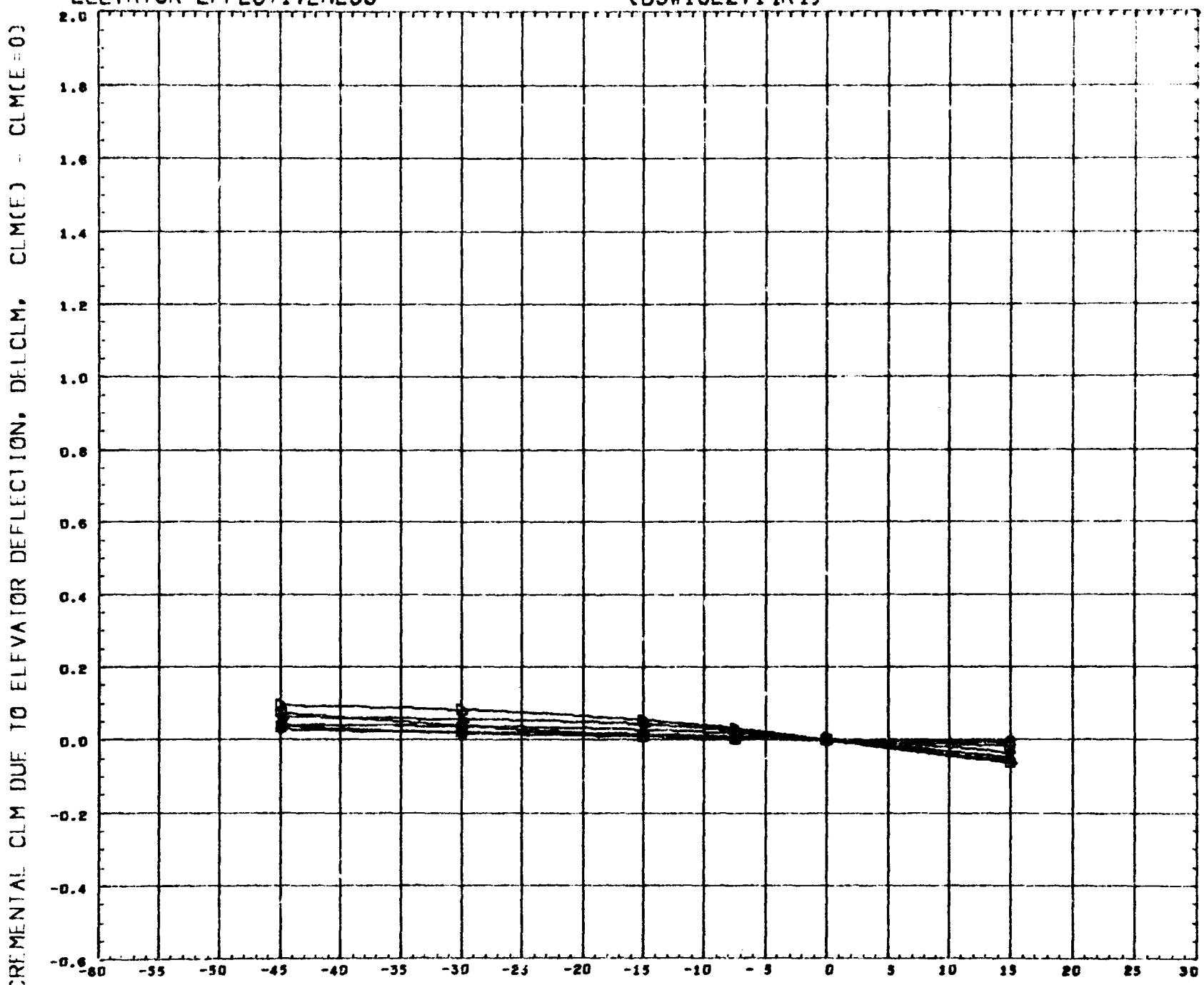


SYMBOL	AILRON		PARAMETRIC VALUES		
O	- 15.000	MACH	4.959	BETA	0.000
□	0.000	ELVATR	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

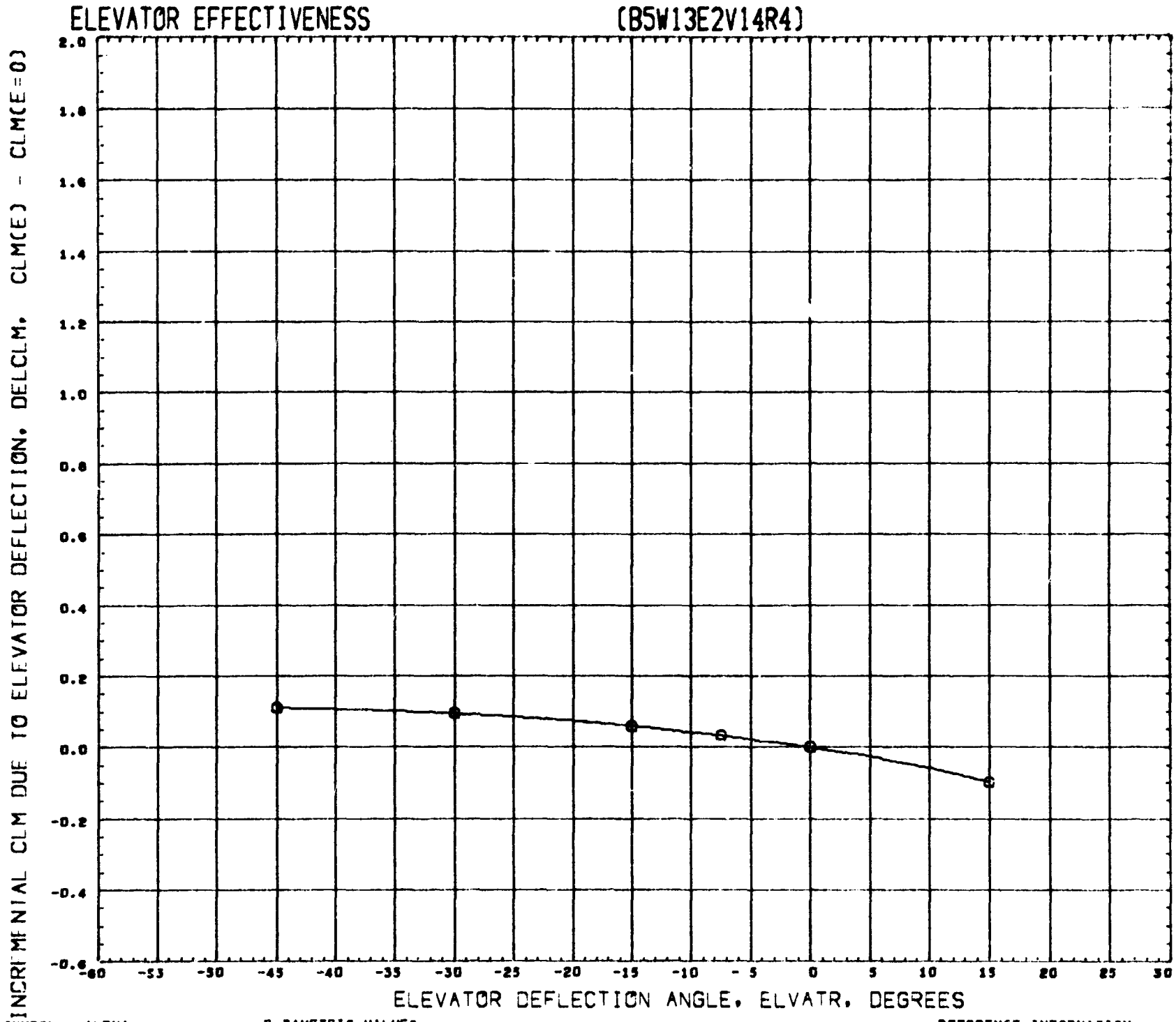
REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.6740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

ELEVATOR EFFECTIVENESS (B5W13E2V14R4)



SYMBOL	ALPHA		PARAMETRIC VALUES		
○	0.000	MACH	5.000	BETA	0.000
□	10.000	AILRON	0.000	RUDDER	0.000
◇	20.000	VRTICL	0.000		
△	30.000				
▽	40.000				
⌵	50.000	REFERENCE FILE	NA 70 446		

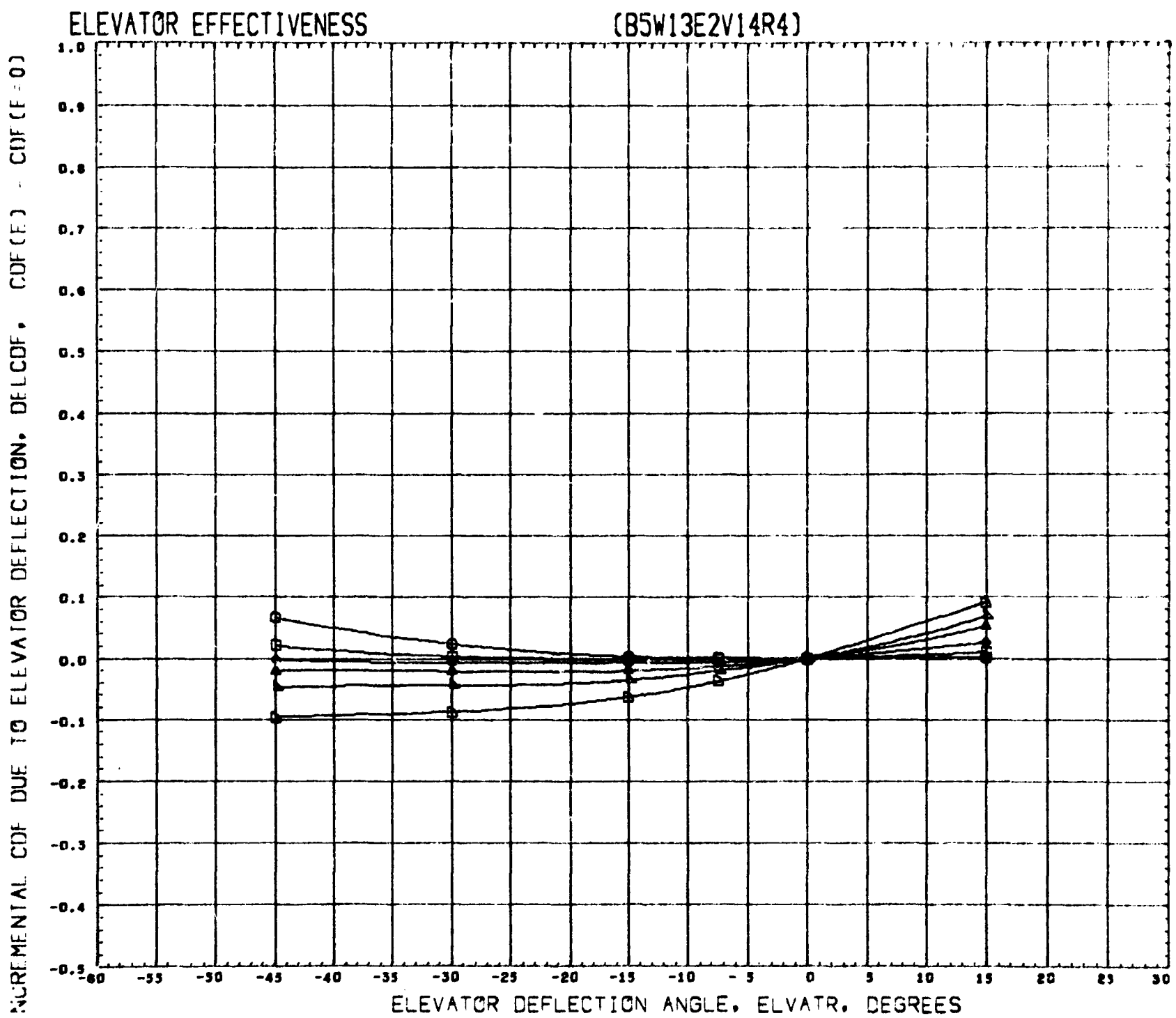
REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE



SYMBOL	ALPHA	PARAMETRIC VALUES			
O	56.000	MACH	5.000	BETA	0.000
		AILRON	0.000	RUDDER	0.000
		VRTICL	0.000		

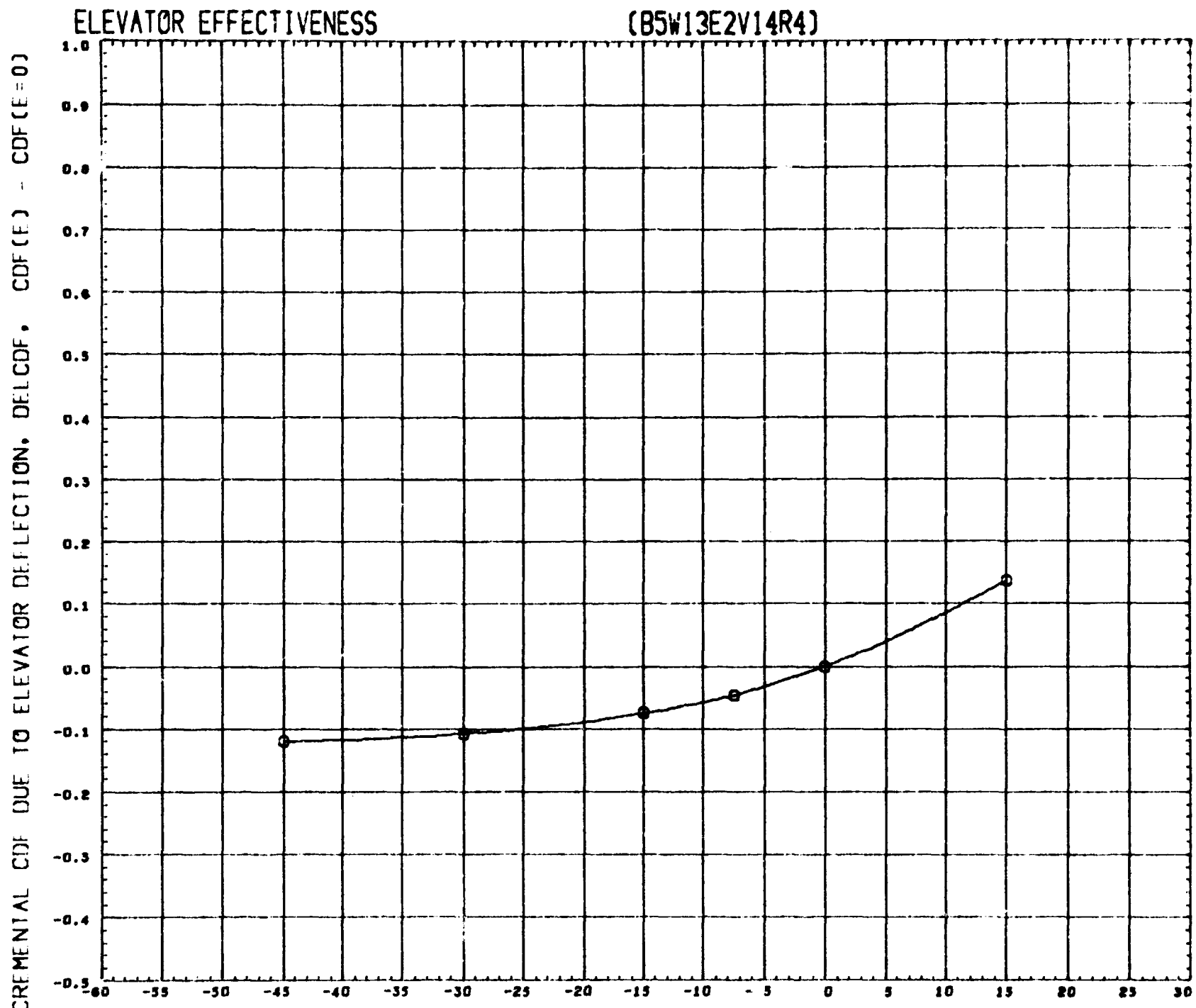
REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE



SYMBOL	ALPHA		PARAMETRIC VALUES		
○	0.000	MACH	5.000	BETA	0.000
□	10.000	AILRON	0.000	RUDDER	0.000
◇	20.000	VRTICL	0.000		
△	30.000				
▽	40.000				
▷	50.000	REFERENCE FILE	NA 70 446		

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

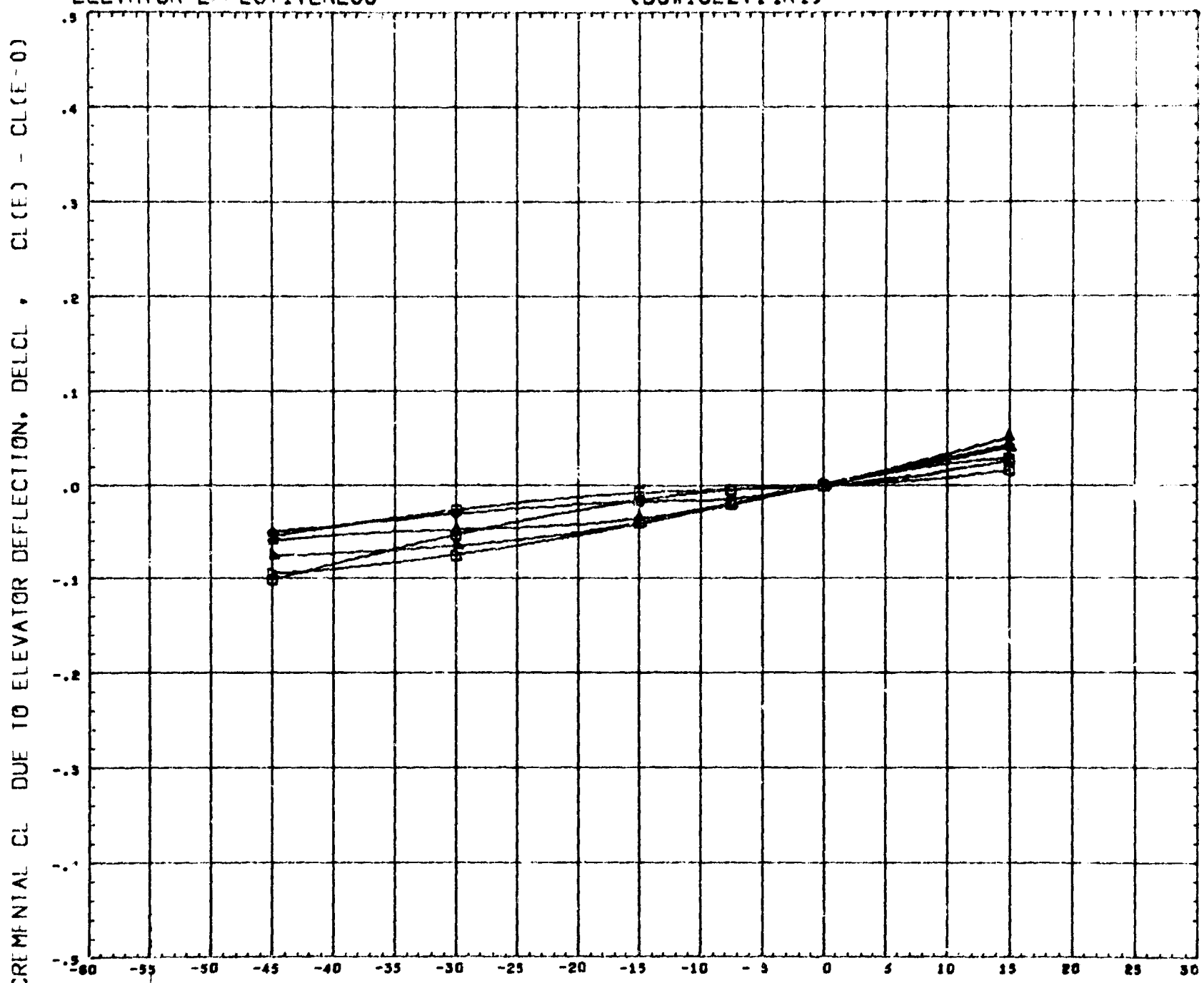


SYMBOL	ALPHA	PARAMETRIC VALUES			
O	56.000	MACH	5.000	BETA	0.000
		AILRON	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

ELEVATOR EFFECTIVENESS (B5W13E2V14R4)



SYMBOL	ALPHA
O	0.000
□	10.000
◇	20.000
△	30.000
▽	40.000
D	50.000

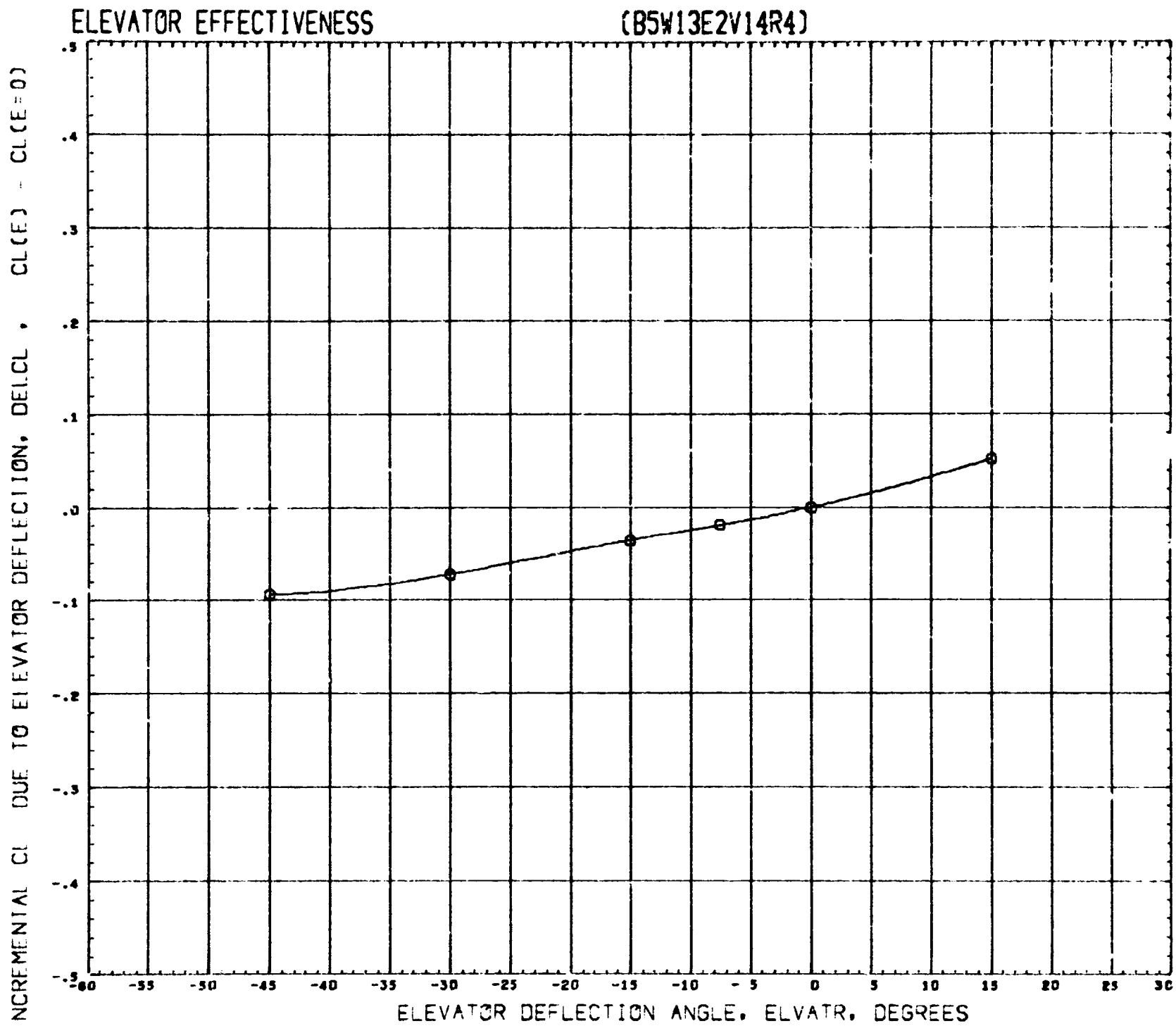
PARAMETRIC VALUES

MACH	5.000	BETA	0.000
AILRON	0.000	RUDDER	0.000
VRTICL	0.000		

REFERENCE FILE NA 70 [illegible]

REFERENCE INFORMATION

REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

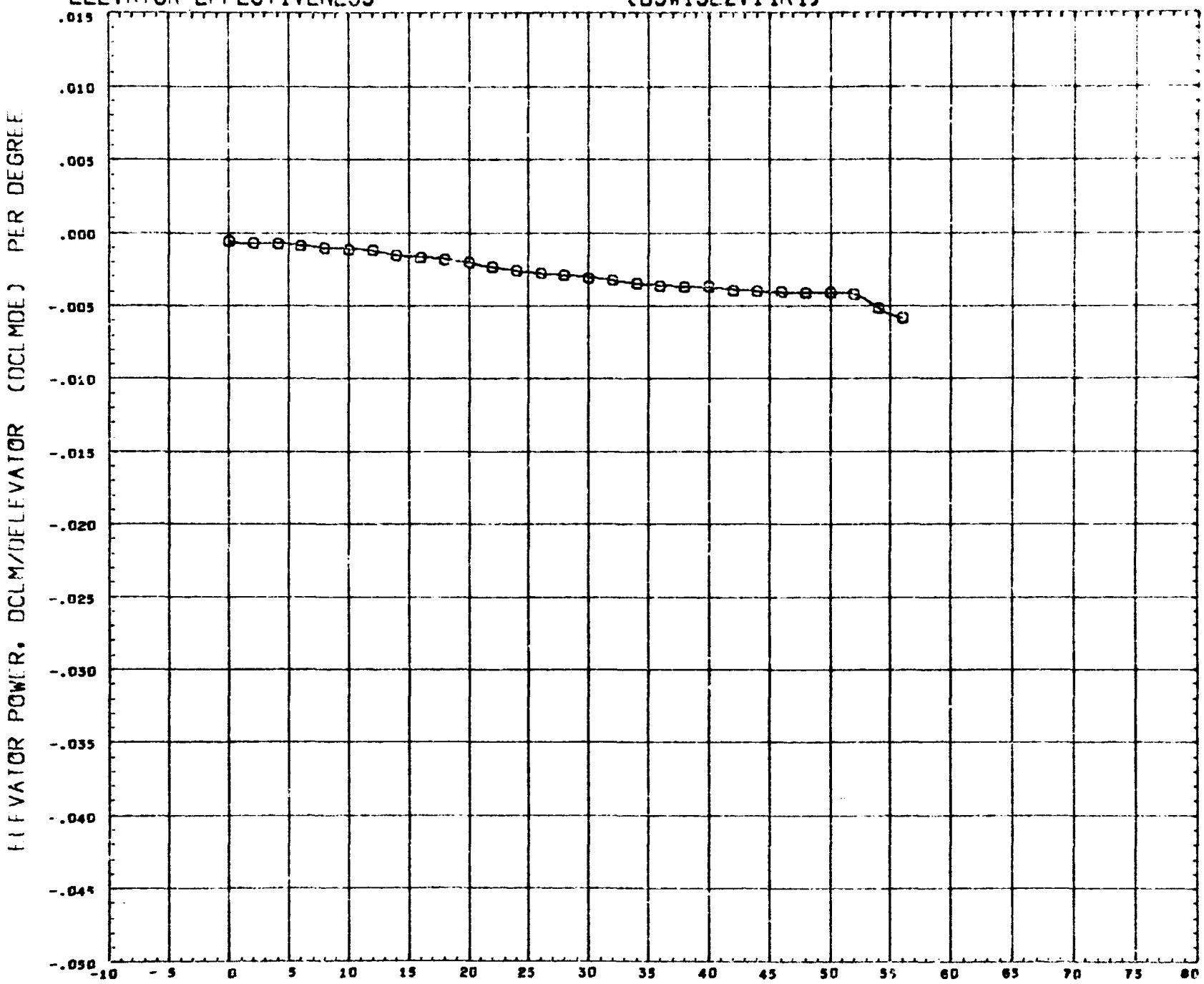


SYMBOL	ALPHA	PARAMETRIC VALUES			
O	56.000	MACH	5.000	BETA	0.000
		AILRON	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.6740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

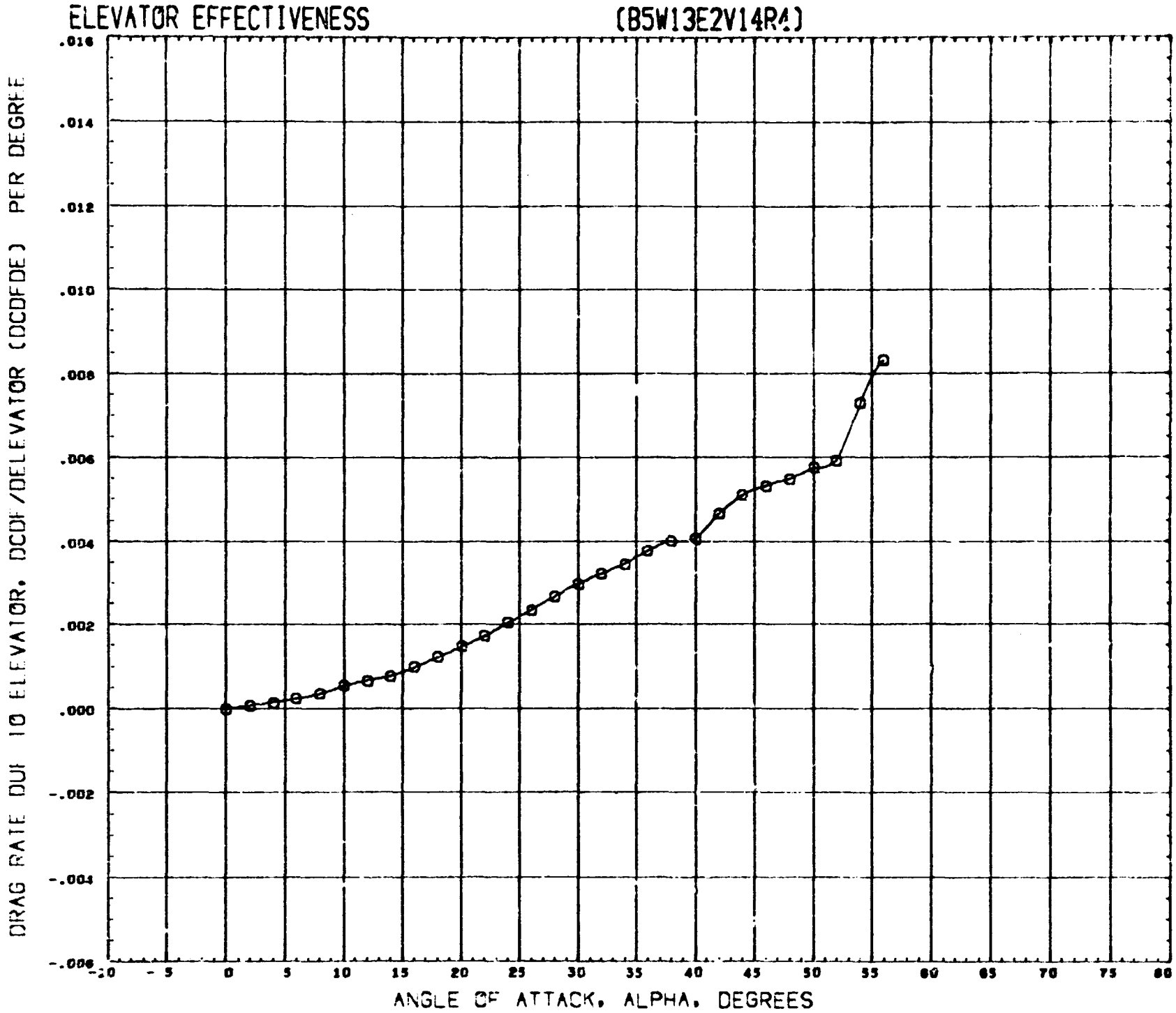
ELEVATOR EFFECTIVENESS (B5W13E2V14R4)



SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	BETA	0.000	ELVATR	- 7.500
		AILRON	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

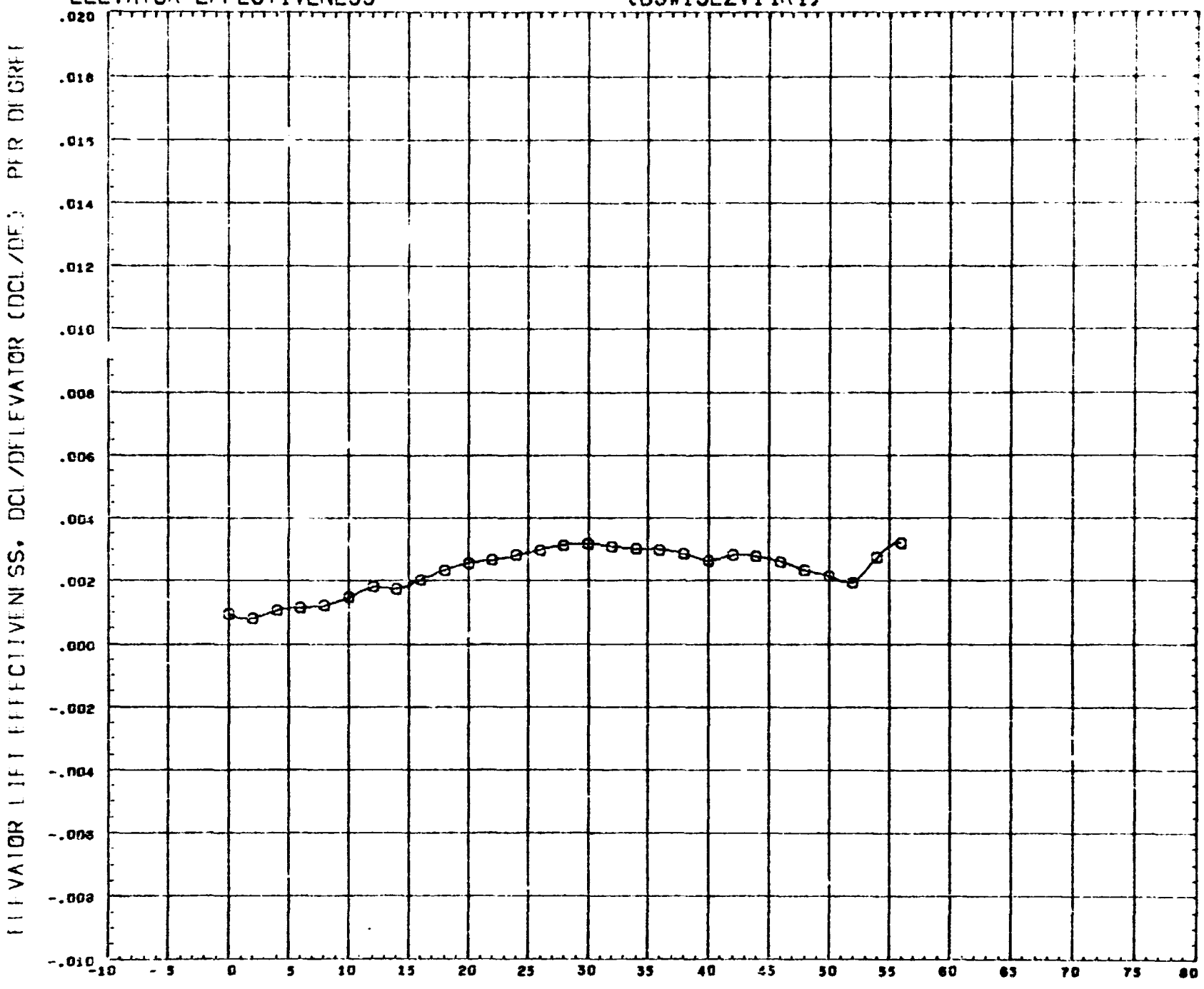


SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	BETA	0.000	ELVATR	- 7.500
		AILRON	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE

REFERENCE INFORMATION		
REFS	10.7320	SQ INCHES
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

ELEVATOR EFFECTIVENESS (B5W13E2V14R4)



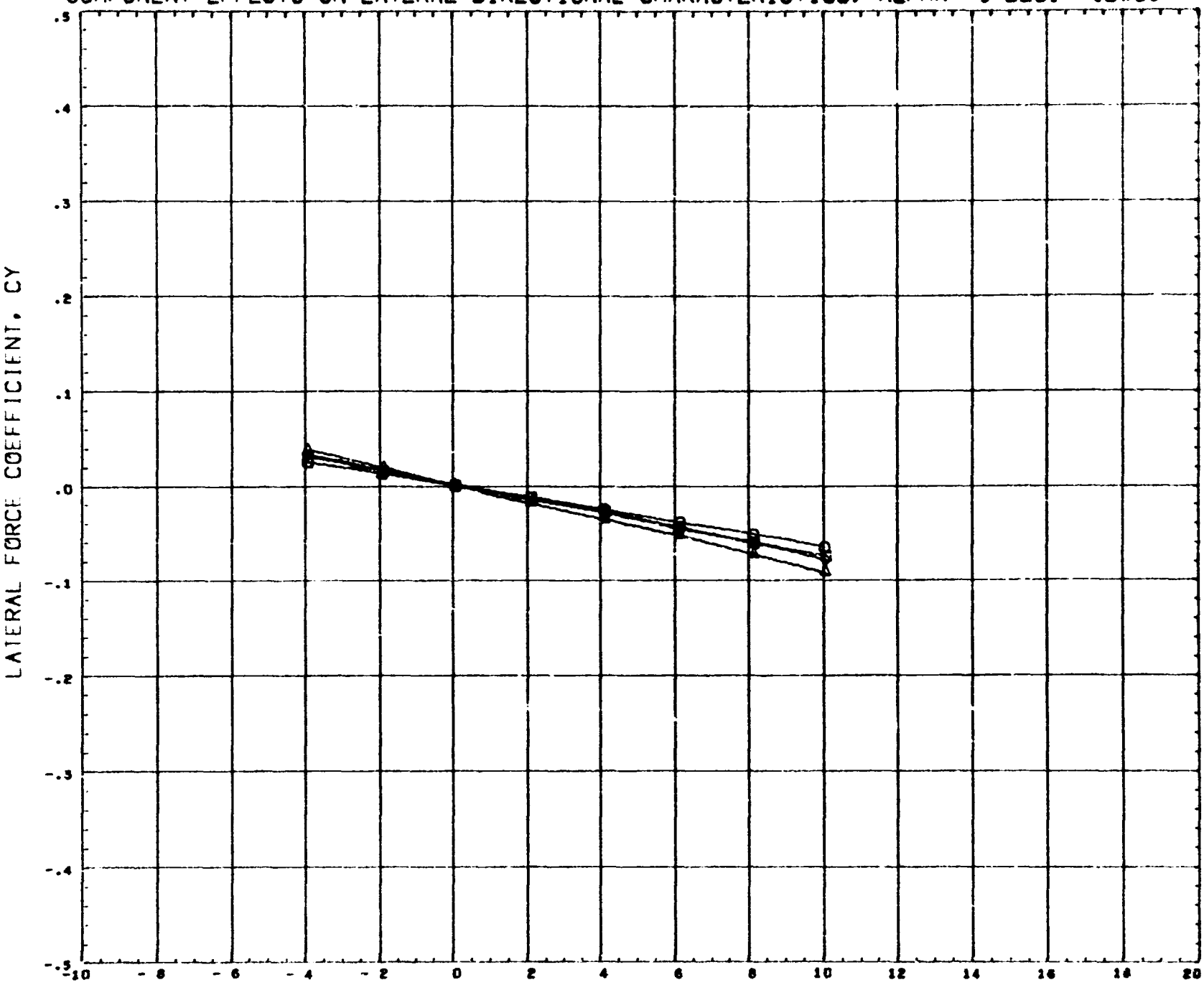
SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	BETA	0.000	ELVATR -	7.500
		AILRON	0.000	RUDDER	0.000
		VRTICL	0.000		

REFERENCE FILE

REFERENCE INFORMATION

REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRF	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA= 0 DEG. (DW0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2101M)	○	MSFC468 NR DELTA ORBITER 35
(V2102M)	□	MSFC468 NR DELTA ORBITER B5W13E2
(V2103M)	◇	MSFC468 NR DELTA ORBITER B5W14E3
(D2104M)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.960

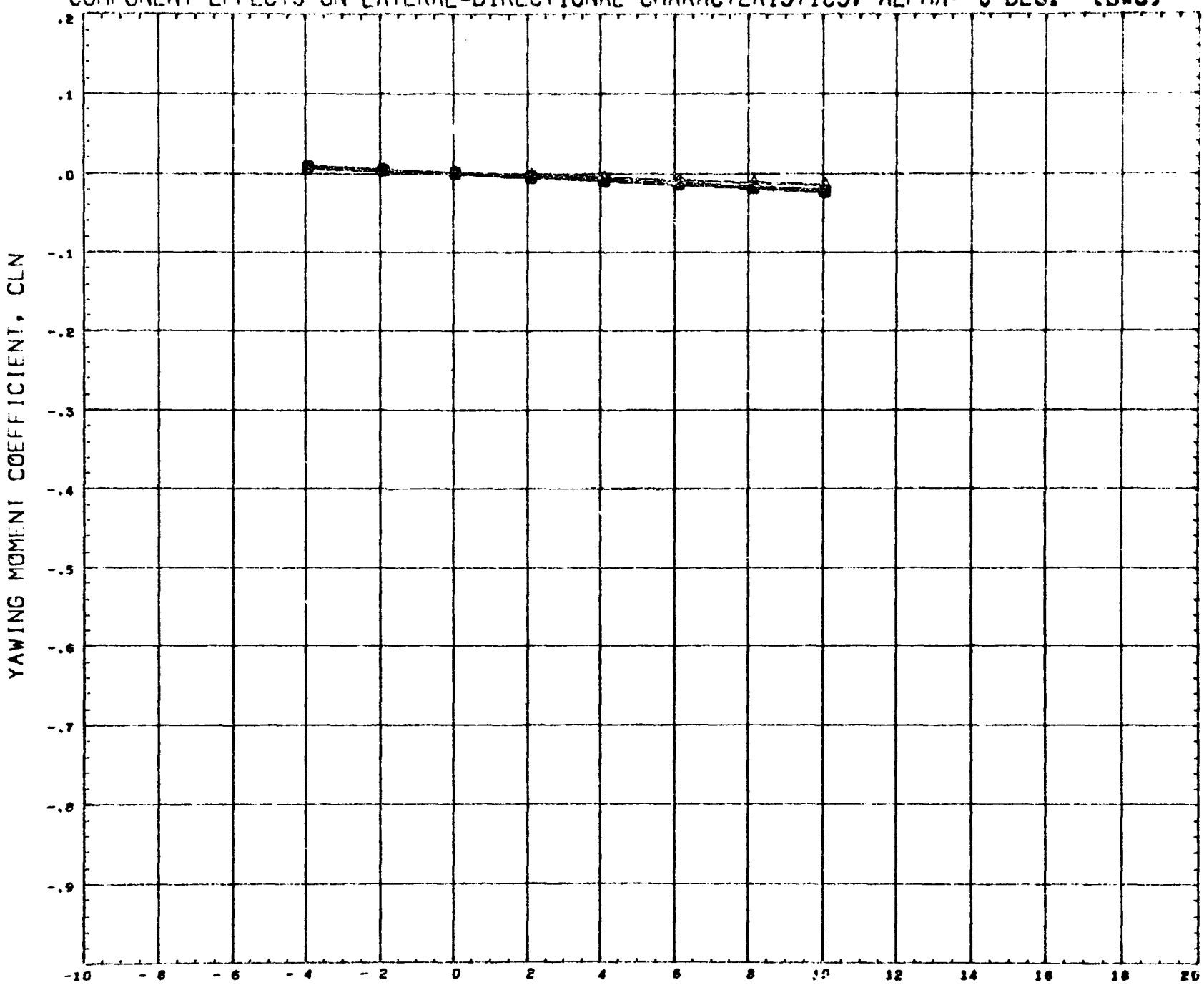
PARAMETRIC VALUES

ALPHA - 0.010

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 0 DEG. (DW0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2101M)	○	MSFC468 NR DELTA ORBITER B5
(V2102M)	□	MSFC468 NR DELTA ORBITER B5W13E2
(V2103M)	◇	MSFC468 NR DELTA ORBITER B5W14E3
(D2104M)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.960

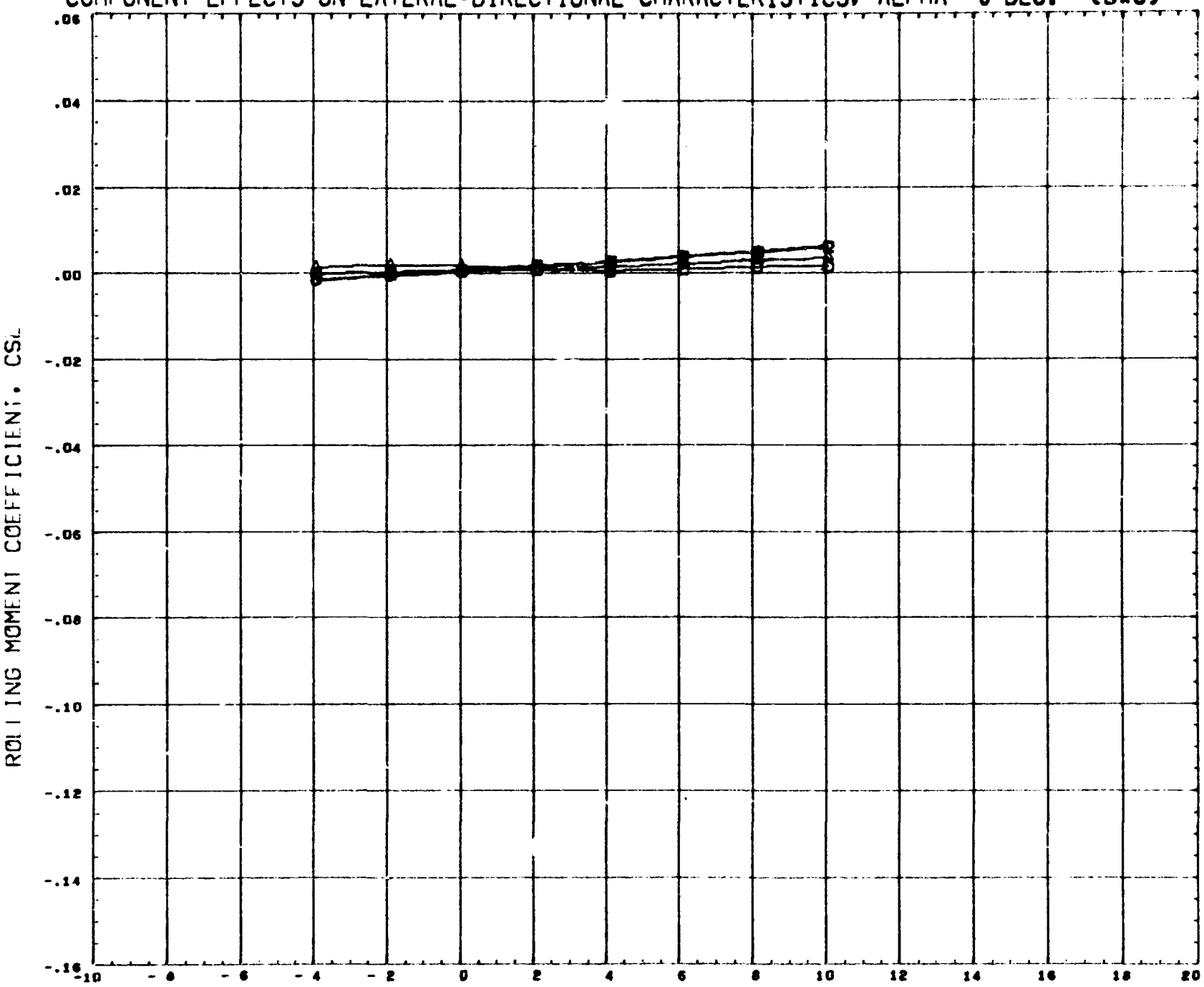
PARAMETRIC VALUES

ALPHA - 0.010

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 0 DEG. (DW0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2101M)	○	MSFC468 NR DELTA ORBITER B5
(V2102M)	□	MSFC468 NR DELTA ORBITER B5W13E2
(V2103M)	◇	MSFC468 NR DELTA ORBITER B5W14E3
(D2104M)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.960

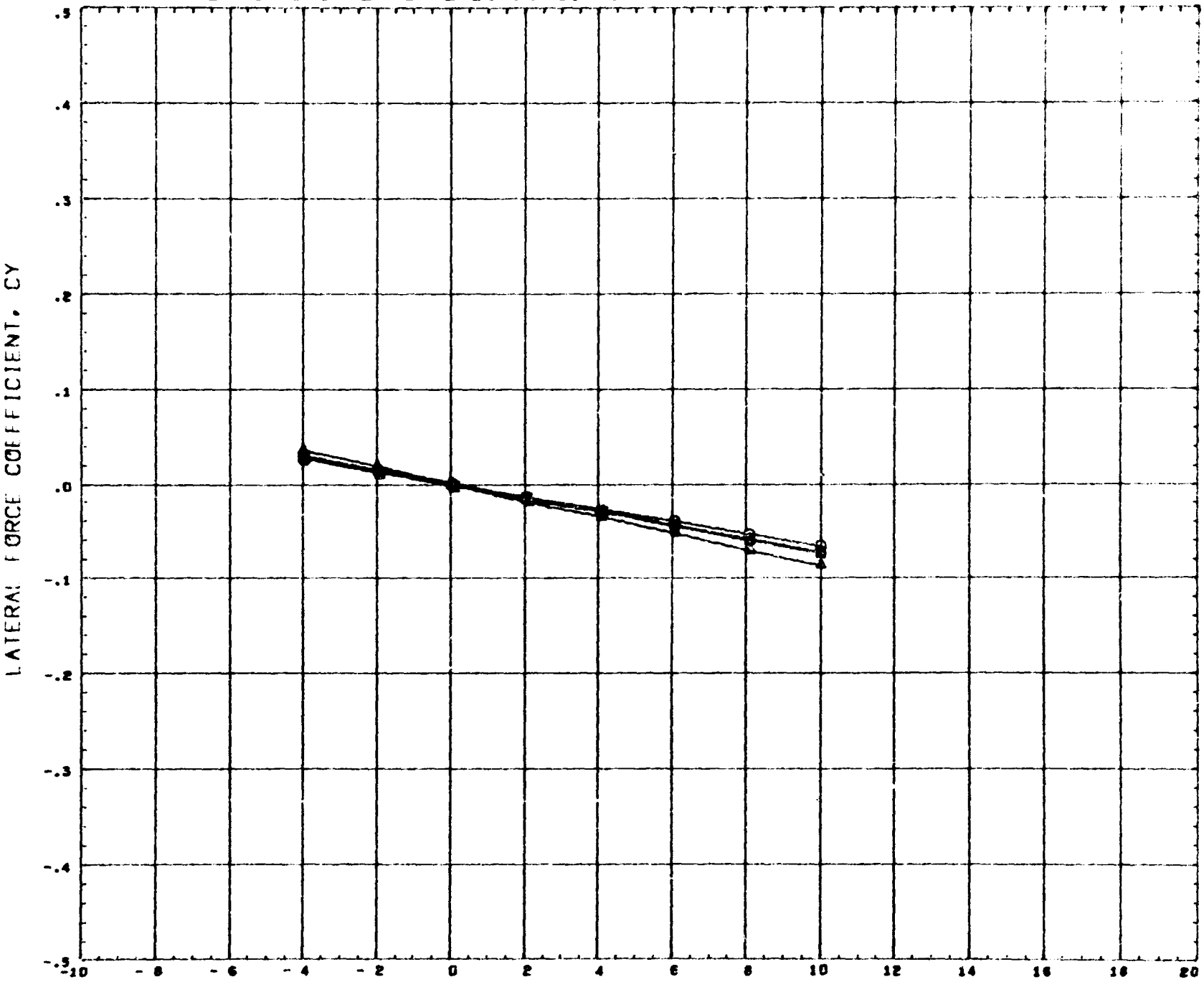
PARAMETRIC VALUES

ALPHA - 0.010

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA= 15 DEG. (DWO)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2101N)	○	MSFC468 NR DELTA ORBITER B5
(V2102N)	□	MSFC468 NR DELTA ORBITER B5W13E2
(V2103N)	◇	MSFC468 NR DELTA ORBITER B5W14E3
(D2104N)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.060

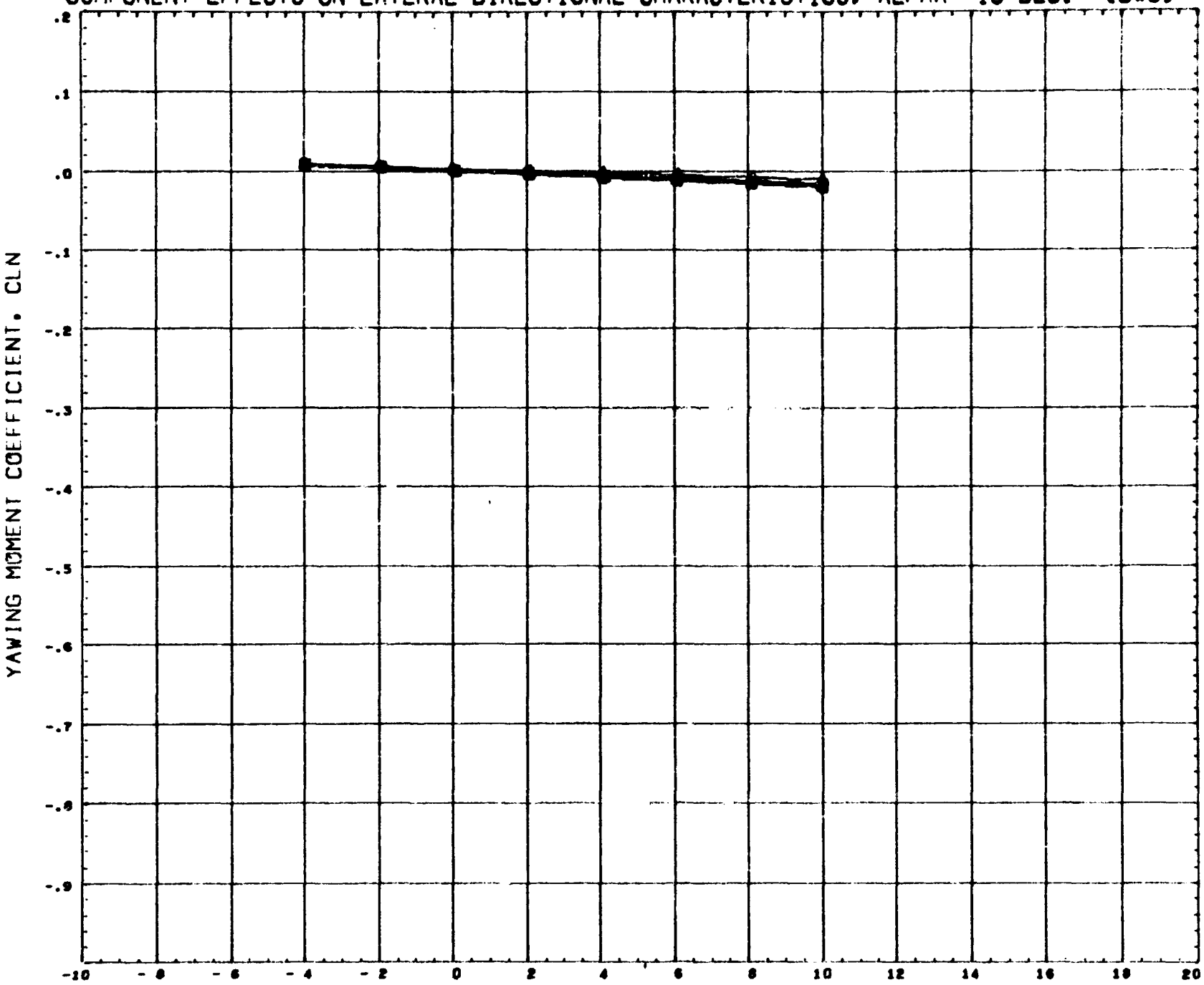
PARAMETRIC VALUES

ALPHA 15.090

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4 980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA= 15 DEG. (DW0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2101N)	○	MSFC468 NR DELTA ORBITER B5
(V2102N)	□	MSFC468 NR DELTA ORBITER B5W13E2
(V2103N)	◇	MSFC468 NR DELTA ORBITER B5W14E3
(D2104N)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.960

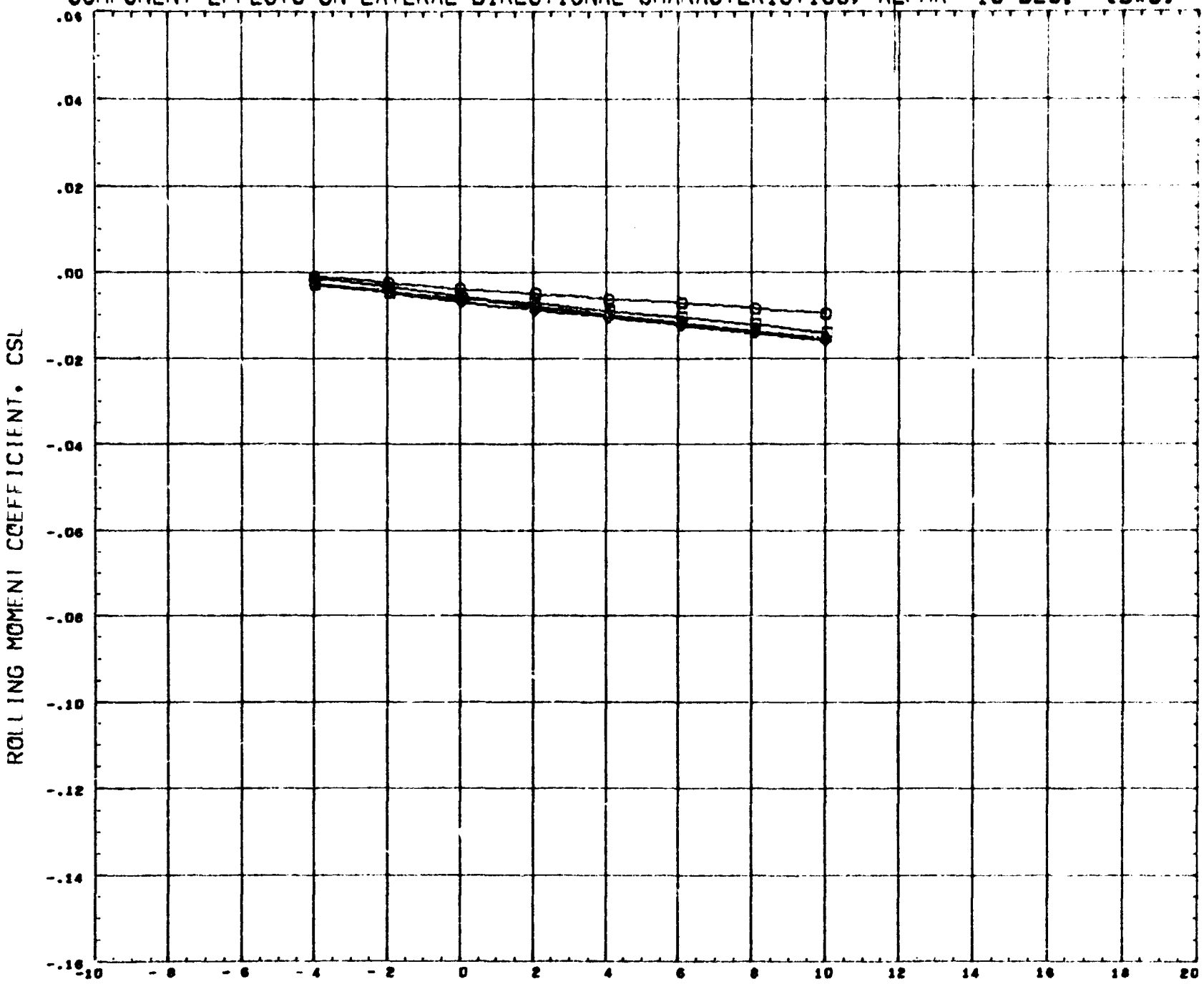
PARAMETRIC VALUES

ALPHA 15.090

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 15 DEG. (DW0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2101N)	○	MSFC468 NR DELTA ORBITER B5
(V2102N)	□	MSFC468 NR DELTA ORBITER B5W13E2
(V2103N)	◇	MSFC468 NR DELTA ORBITER B5W14E3
(D2104N)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.960

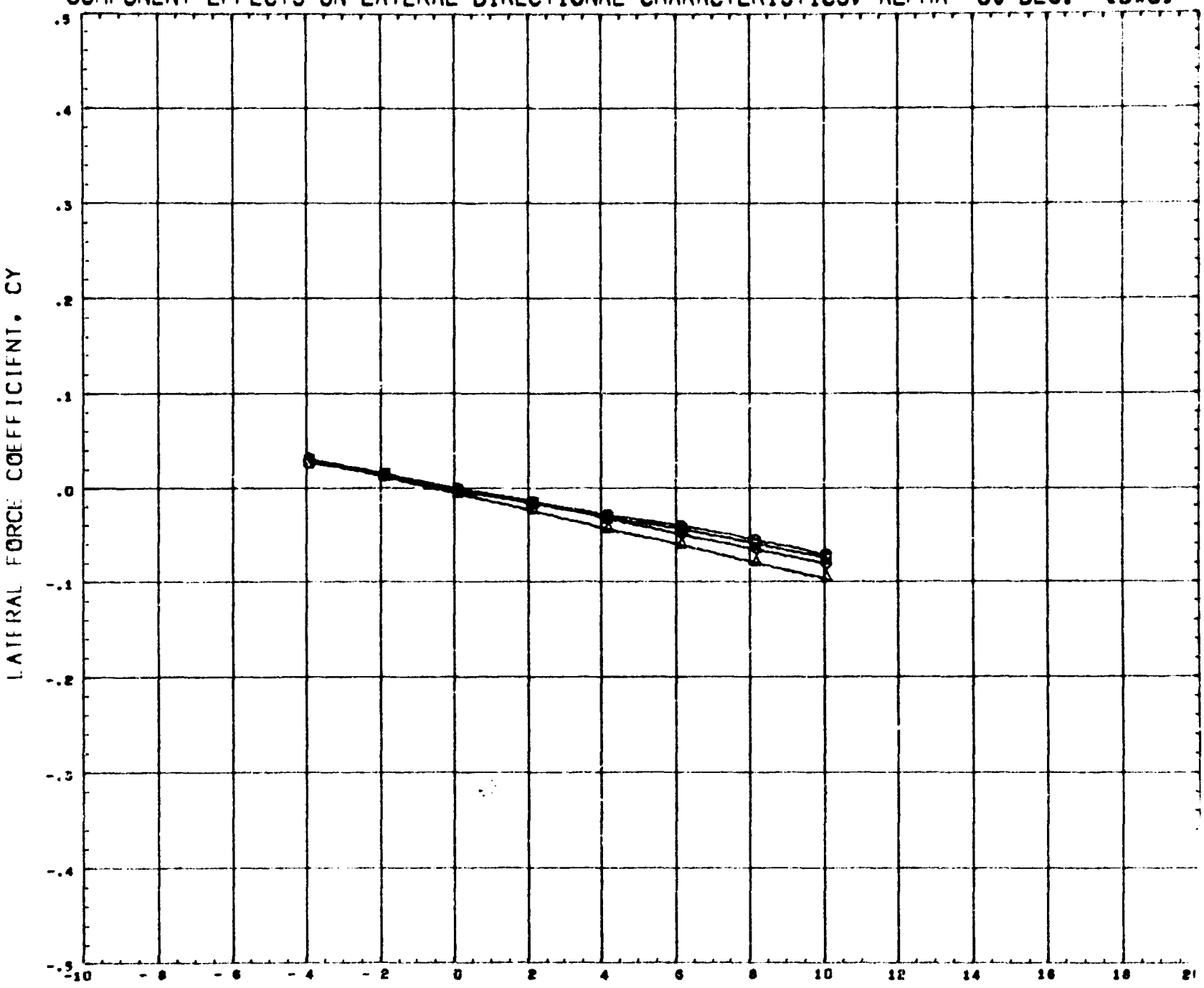
PARAMETRIC VALUES

ALPHA 15.090

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 30 DEG. (DW0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V21010)	○	MSFC468 NR DELTA ORBITER B5
(V21020)	□	MSFC468 NR DELTA ORBITER B5W13E2
(V21030)	◇	MSFC468 NR DELTA ORBITER B5W14E3
(D21040)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.960

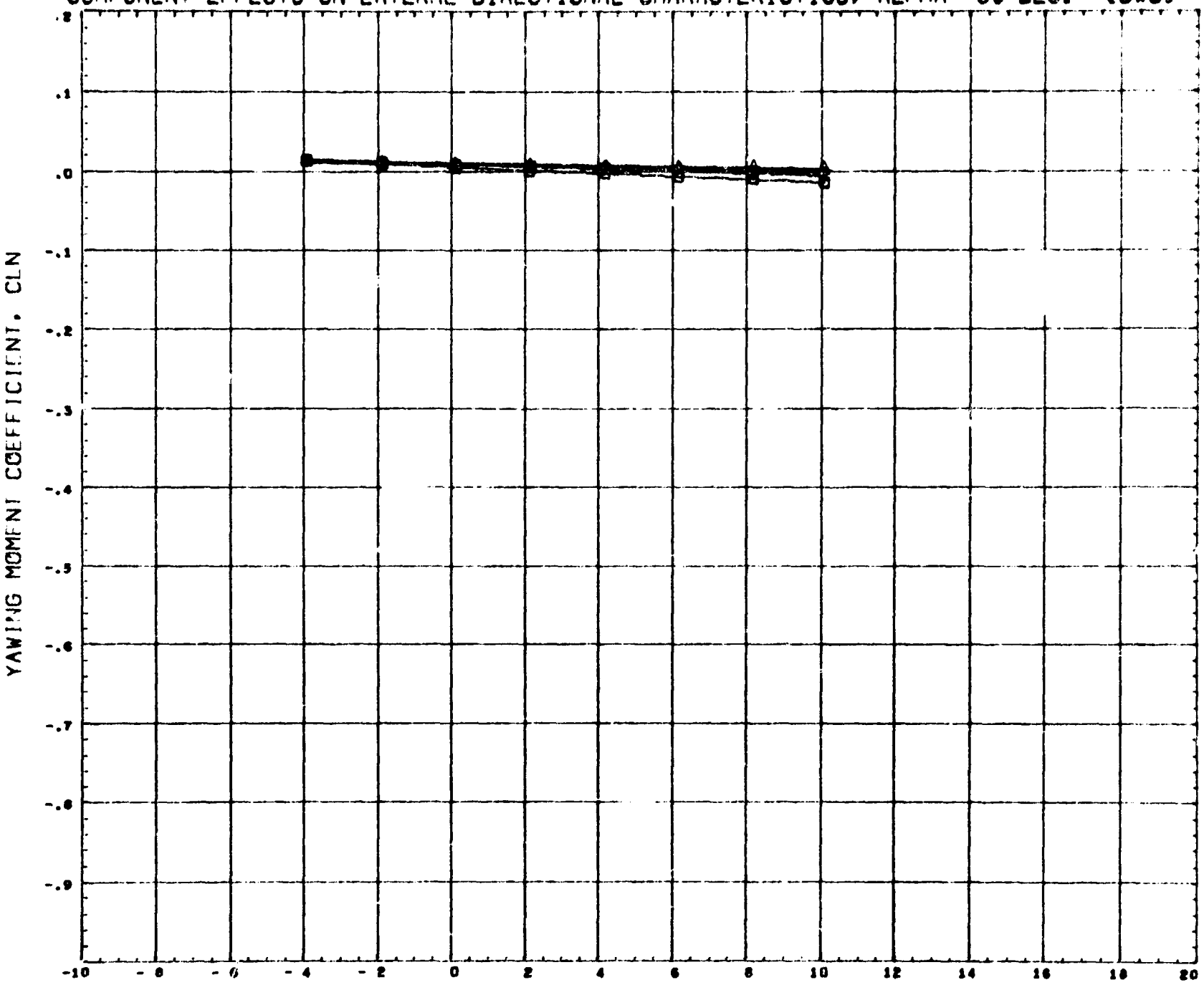
PARAMETRIC VALUES

ALPHA 30.740

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.674	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 30 DEG. (DW0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V21010)	○	MSFC468 NR DELTA ORBITER B5
(V21020)	□	MSFC469 NR DELTA ORBITER B5W13E?
(V21030)	◇	MSFC468 NR DELTA ORBITER B5W14E3
(D21040)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

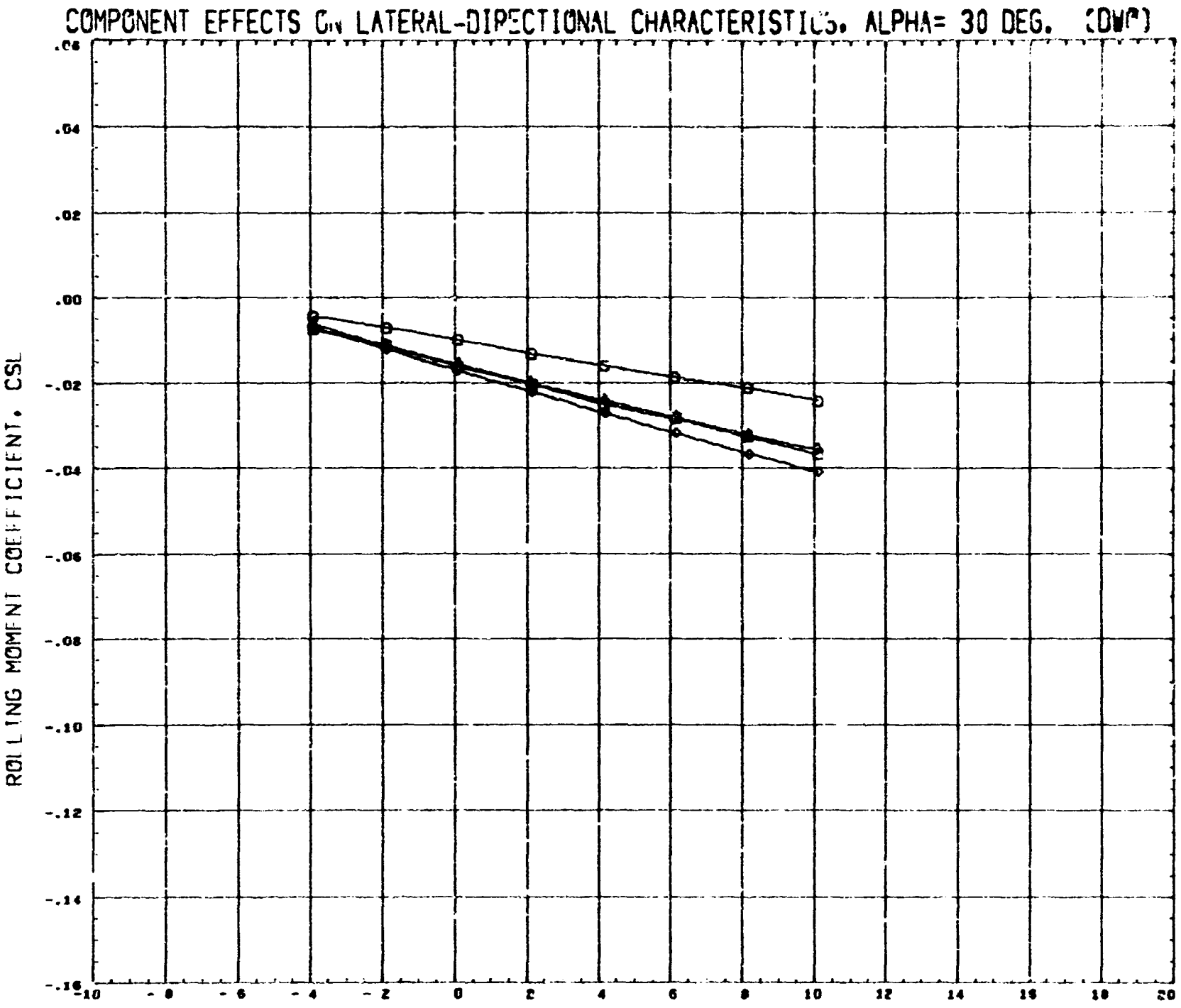
MACH 4.960

PARAMETRIC VALUES

ALPHA 30.740

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V21010)	○	MSFC468 NR DELTA ORBITER B5
(V21020)	□	MSFC468 NR DELTA ORBITER B5W13E2
(V21030)	◇	MSFC468 NR DELTA ORBITER B5W14E3
(D21040)	△	MSFC 468 NR DELTA ORBITER 55W13E2V14R4

MACH 4.960

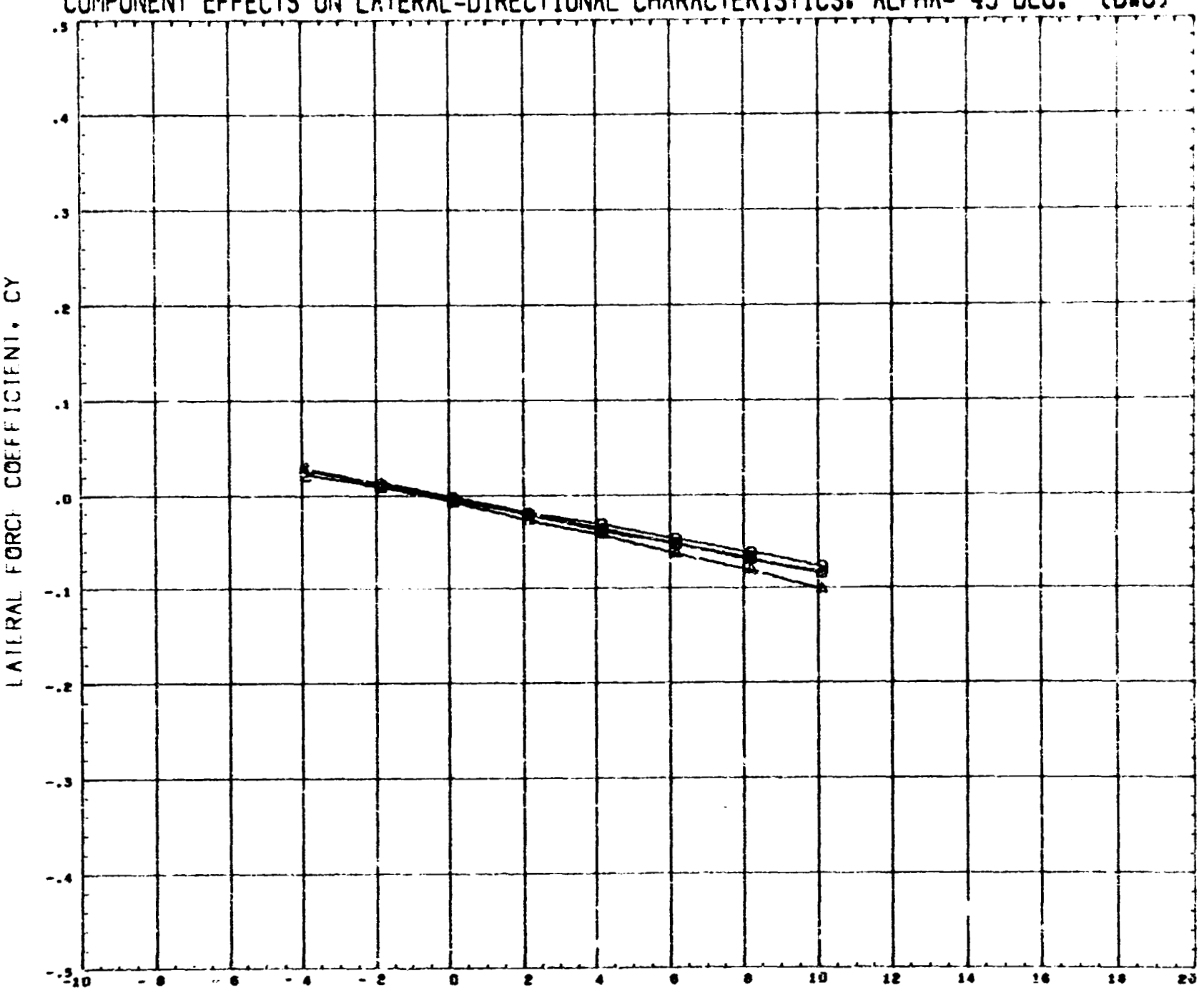
PARAMETRIC VALUES

ALPHA 30.740

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRF	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA= 45 DEG. (DWO)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2101P)	○	MSFC468 NR DELTA ORBITER B5
(V2102F)	□	MSFC468 NR DELTA ORBITER B5W13E2
(V2103P)	◇	MSFC468 NR DELTA ORBITER B5W14E3
(D2104F)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.960

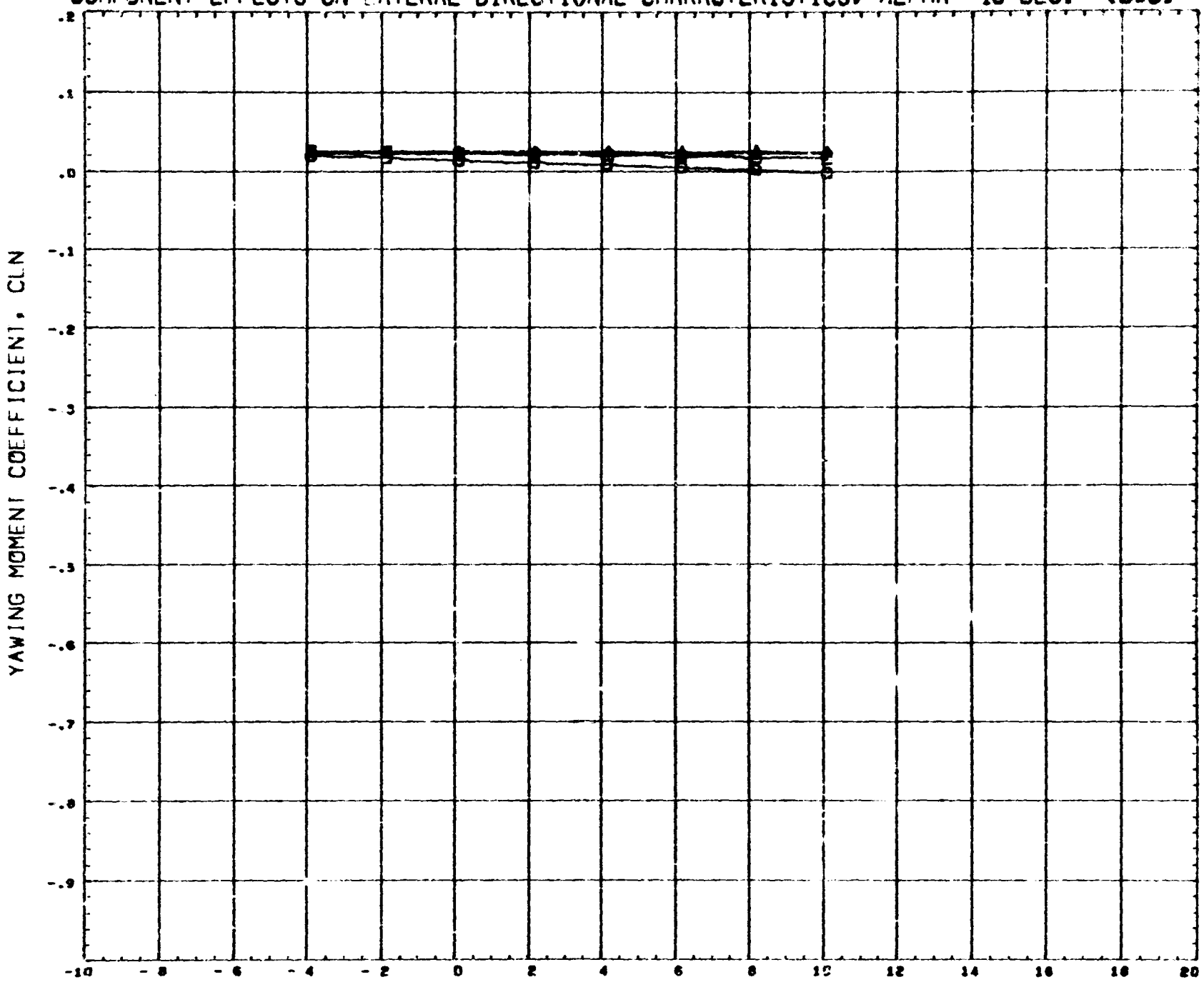
PARAMETRIC VALUES

ALPHA 45.670

REFERENCE INFORMATION

REFS	10.752	SQ INC
REFL	2.874	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.005	SCALE

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 45 DEG. (DWO)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2101P)	○	MSFC468 NR DELTA ORBITER DS
(V2102P)	□	MSFC468 NR DELTA ORBITER B5W13E2
(V2103P)	◇	MSFC468 NR DELTA ORBITER B5W14E3
(D2104P)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.960

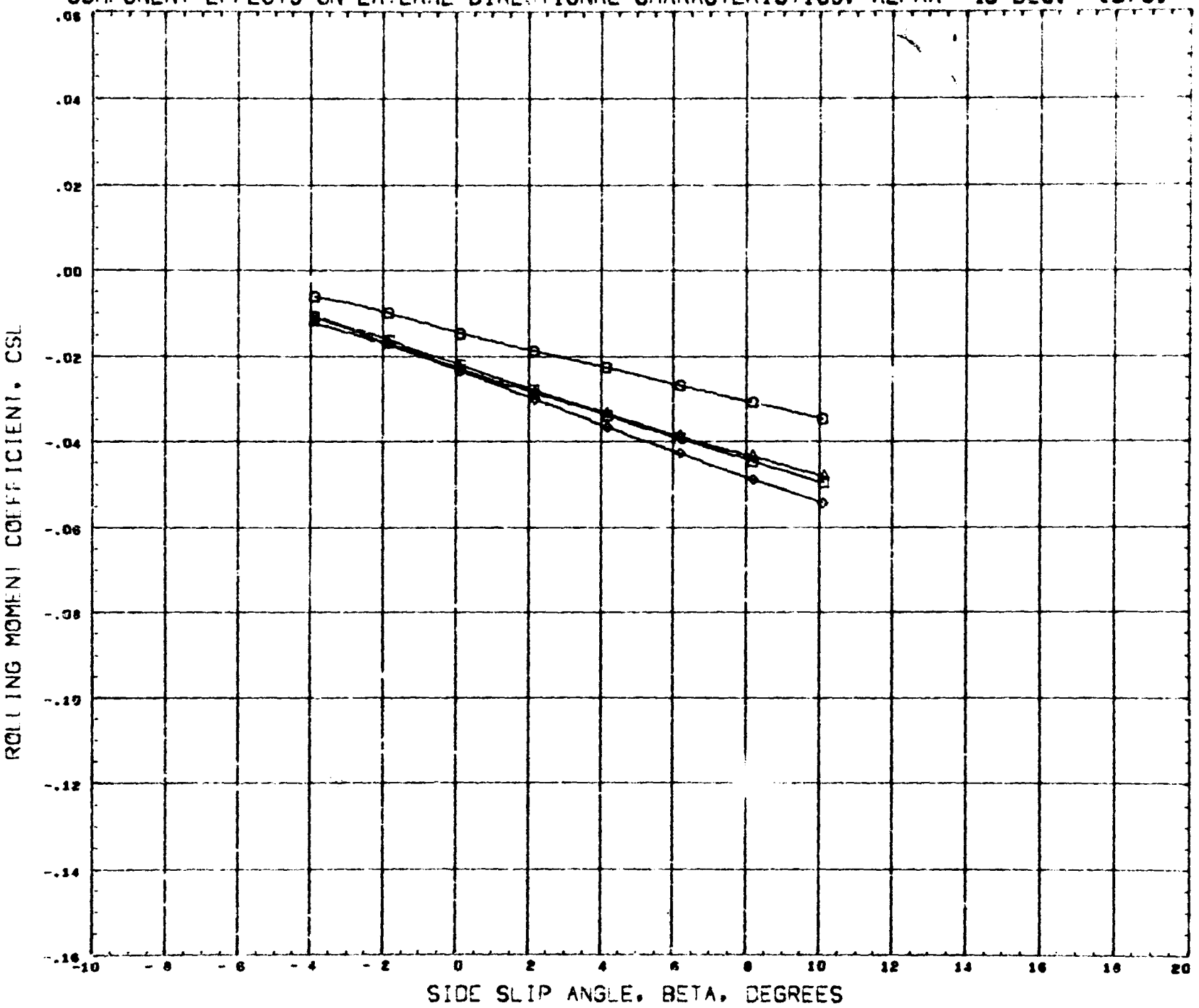
PARAMETRIC VALUES

ALPHA 45.670

REFERENCE INFORMATION

REFS	10.7[illegible]	SQ INC
[illegible]FFL	2.674	INCHES
[illegible]TB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	S[illegible]E

COMPONENT EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA= 45 DEG. (DW0)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(V2101P)	○	MSFC468 NR DELTA ORBITER B5
(V2102P)	□	MSFC483 NR DELTA ORBITER B5W13E2
(V2103P)	◇	MSFC468 NR DELTA ORBITER B5W14E3
(D2104P)	△	MSFC 468 NR DELTA ORBITER B5W13E2V14R4

MACH 4.900

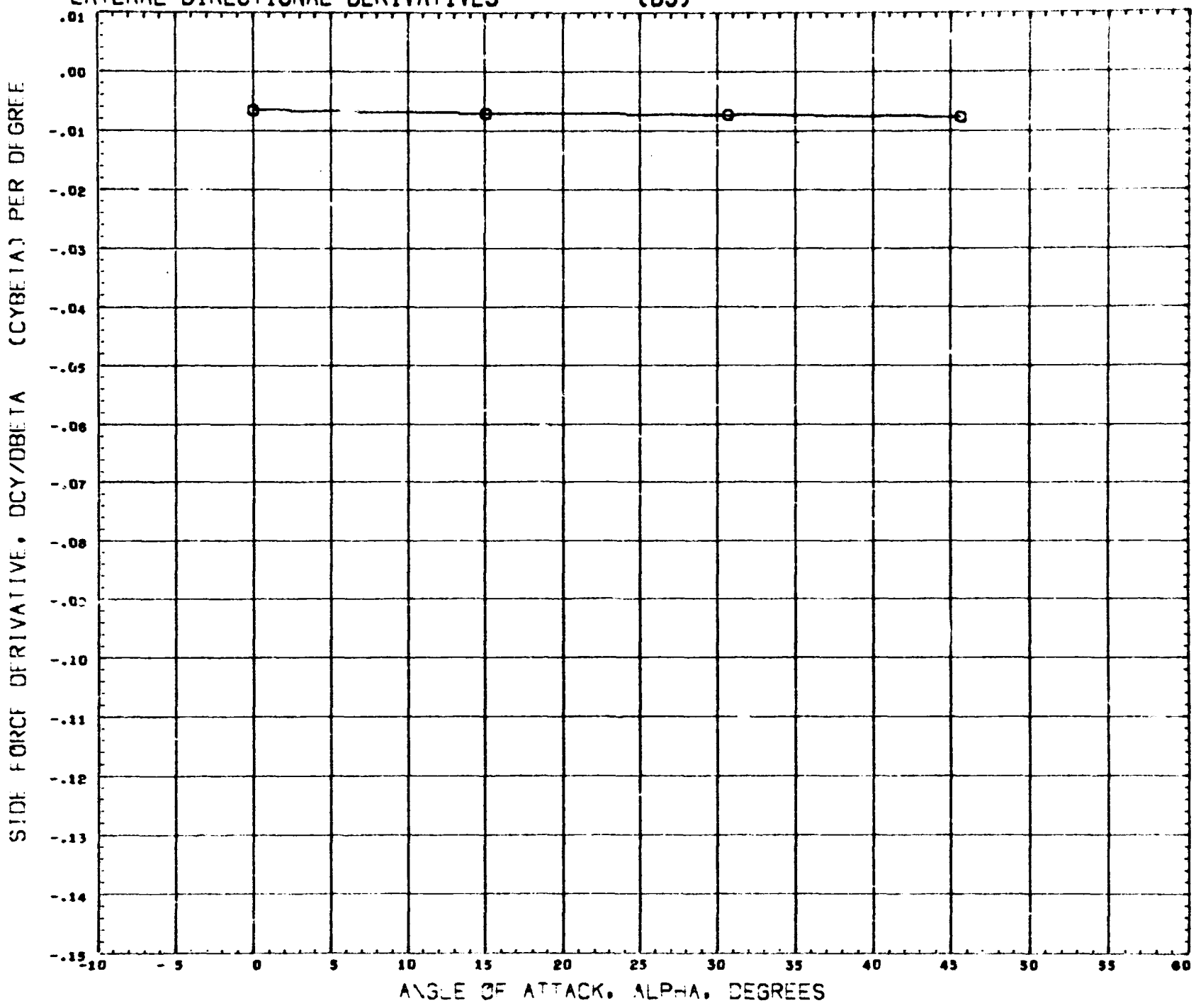
PARAMETRIC VALUES

ALPHA 45.670

REFERENCE INFORMATION

REFS	10.732	SQ INC
REFL	2.674	INCHES
REFB	4.980	INCHES
XMRP	4.979	INCHES
YMRP	0.000	INCHES
ZMRP	0.455	INCHES
SCALE	0.003	SCALE

LATERAL-DIRECTIONAL DERIVATIVES (B5)



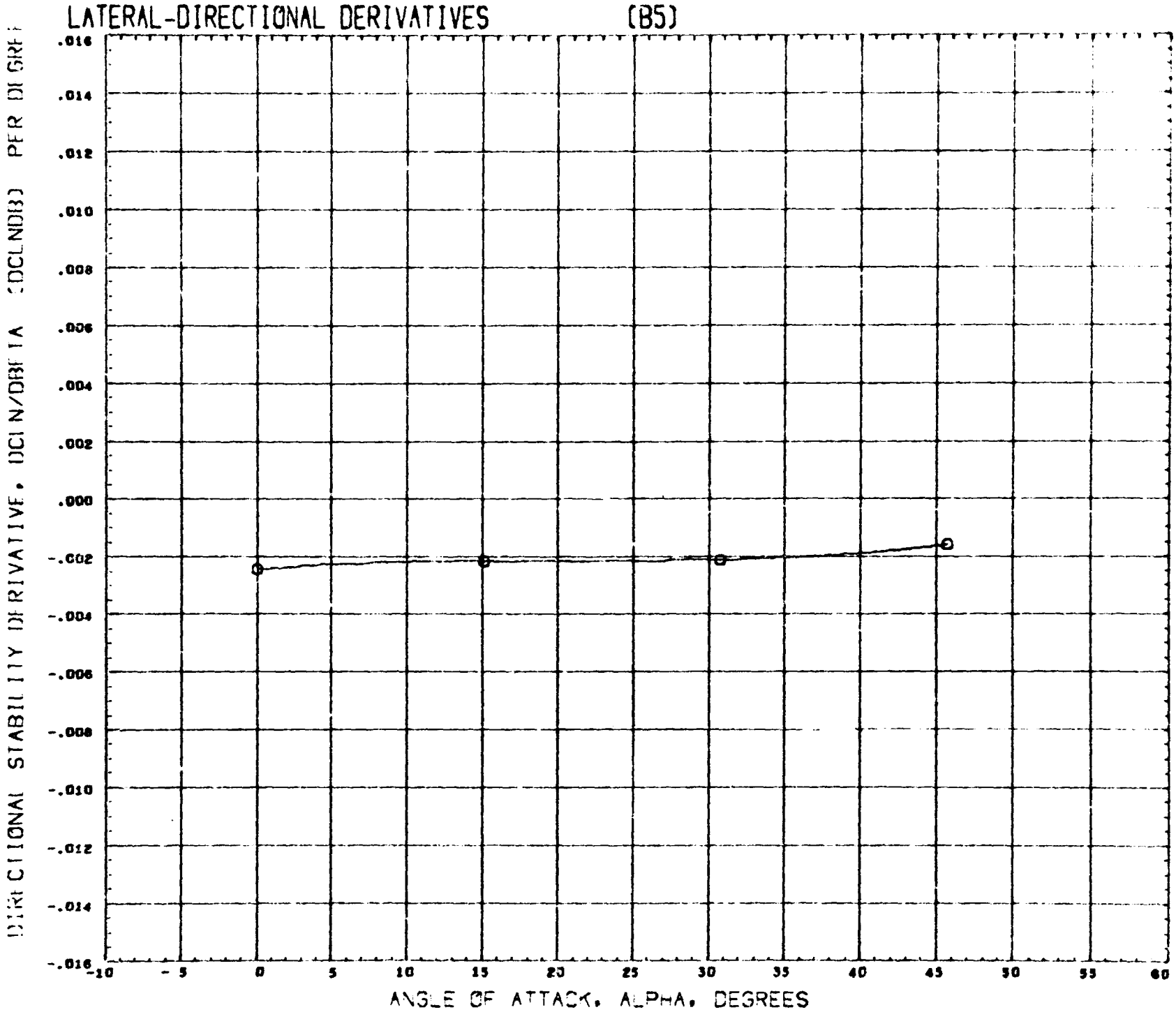
SYMBOL	MACH
O	5.000

REFERENCE INFORMATION

REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 44U

LATERAL-DIRECTIONAL DERIVATIVES (B5)

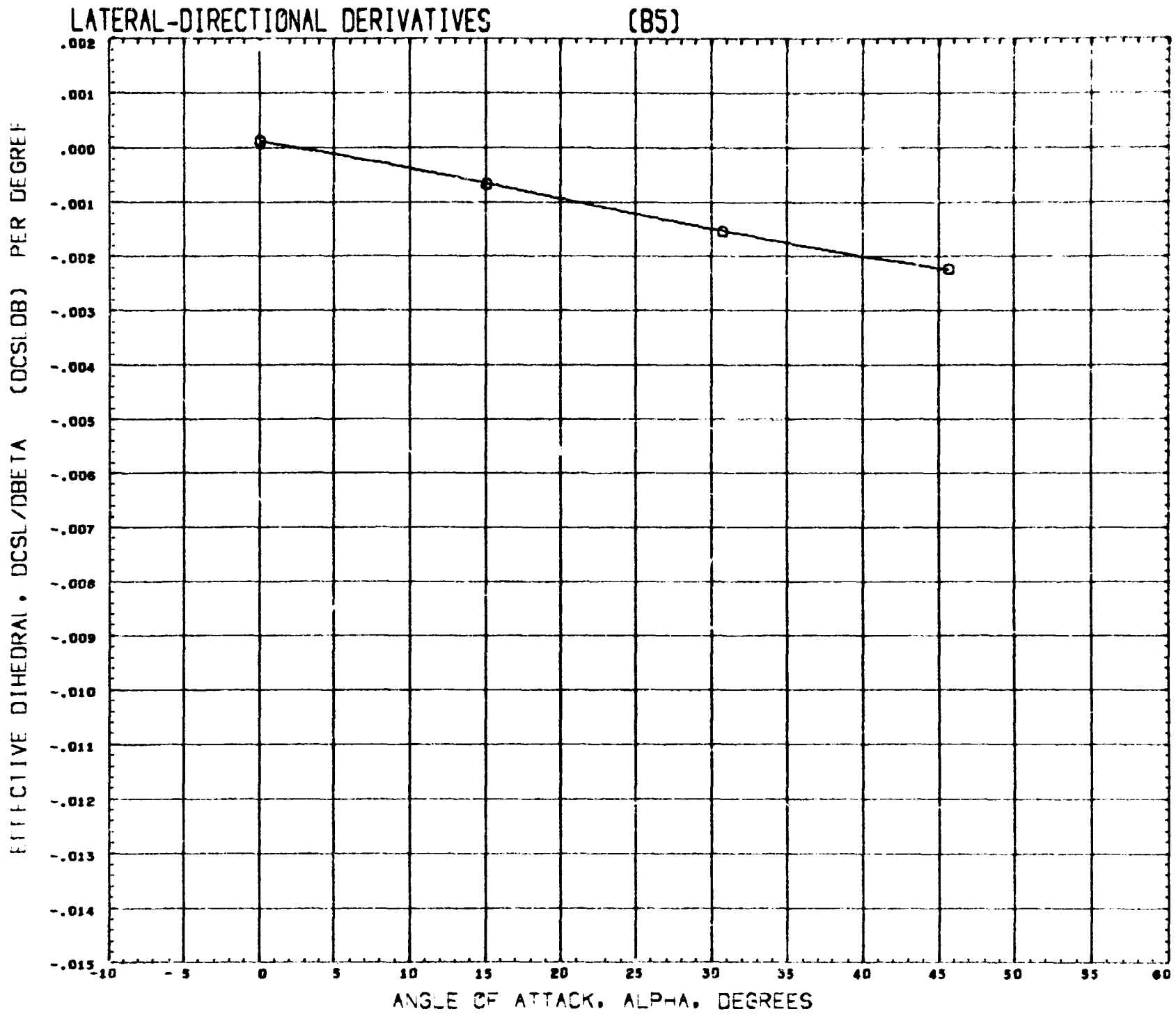


SYMBOL	MACH
O	5.000

REFERENCE INFORMATION

REFS	10.7320	SQ INC
REFL	2.6740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446



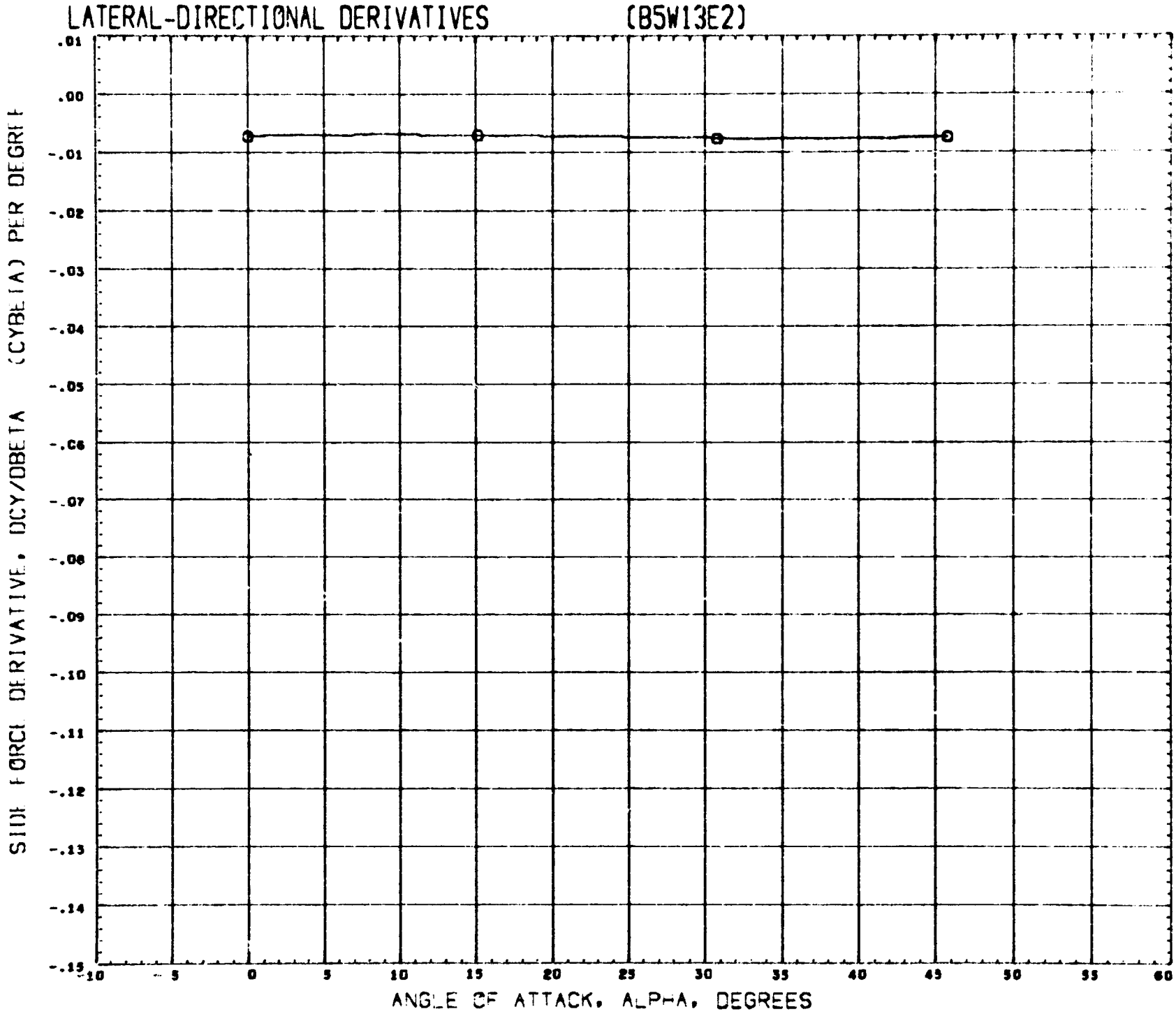
SYMBOL	MACH
O	5.000

REFERENCE INFORMATION

REFS	10.7320	SQ INC
REFL	2.6740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

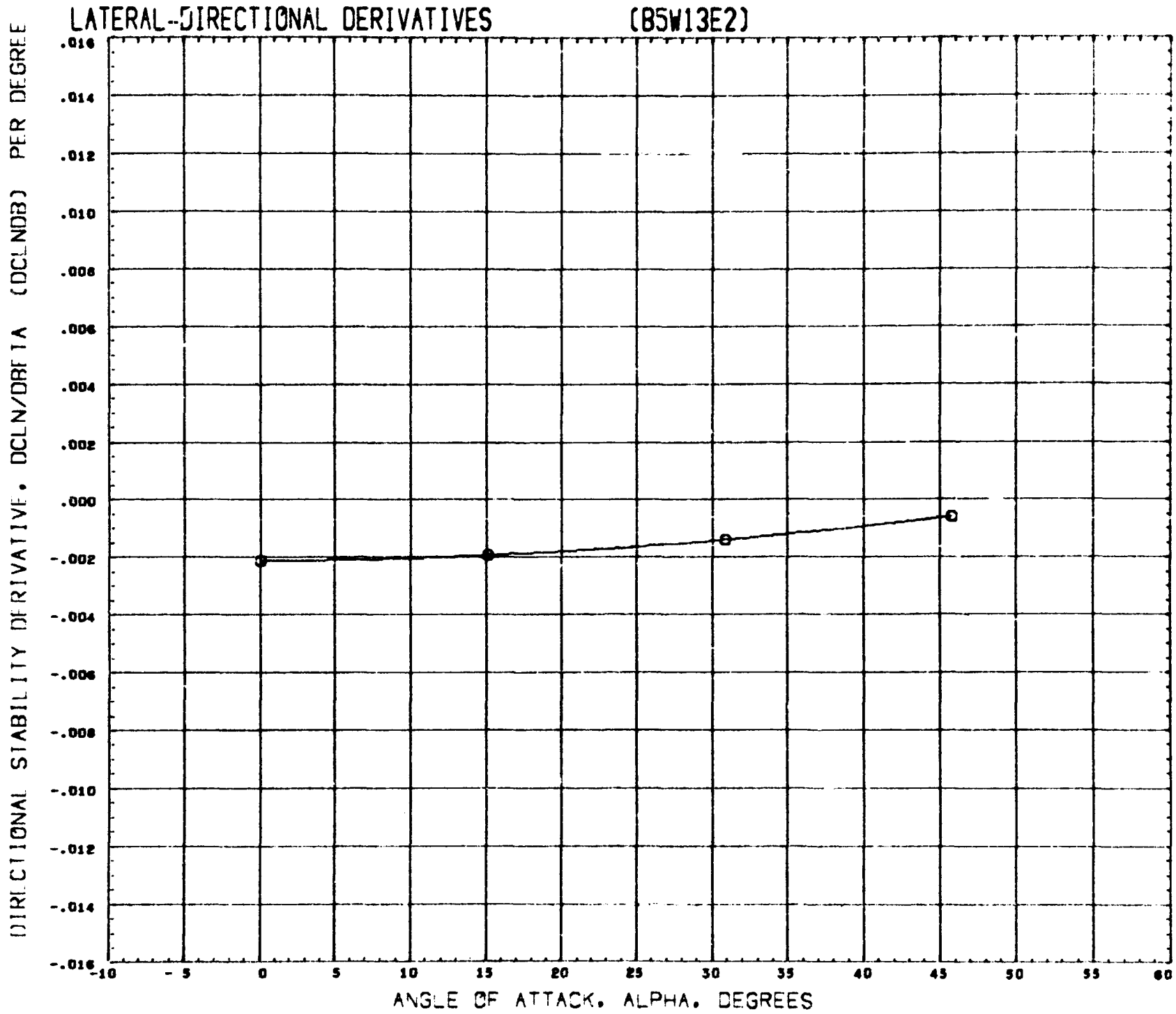
LATERAL-DIRECTIONAL DERIVATIVES (B5W13E2)



SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000

REFERENCE INFORMATION		
REFS	10.7320	SQ INCHES
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446



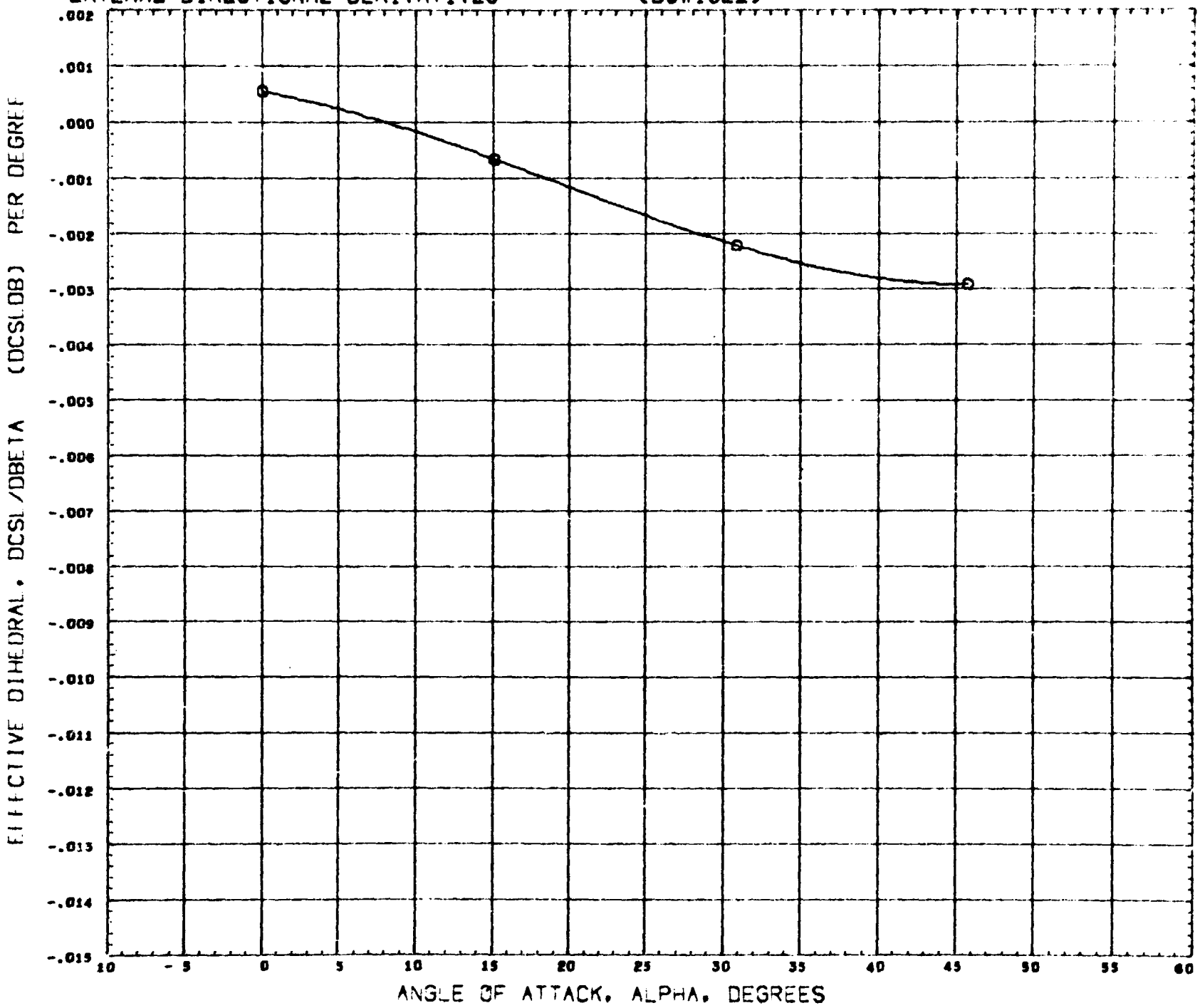
SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000

REFERENCE INFORMATION

REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

LATERAL-DIRECTIONAL DERIVATIVES (B5W13E2)



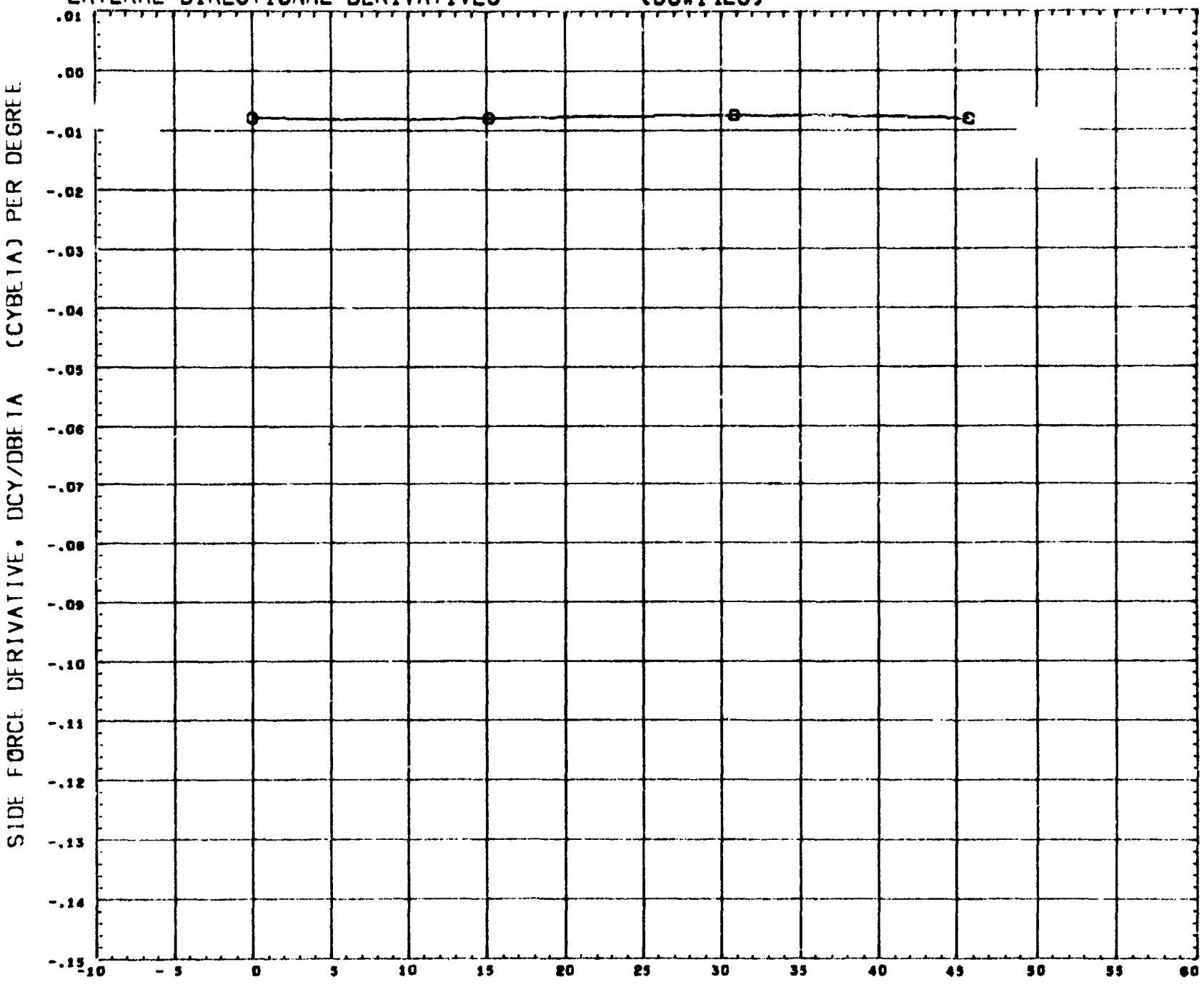
SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000

REFERENCE INFORMATION

REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

REFERENCE FILE NA 70 446

LATERAL-DIRECTIONAL DERIVATIVES (B5W14E3)

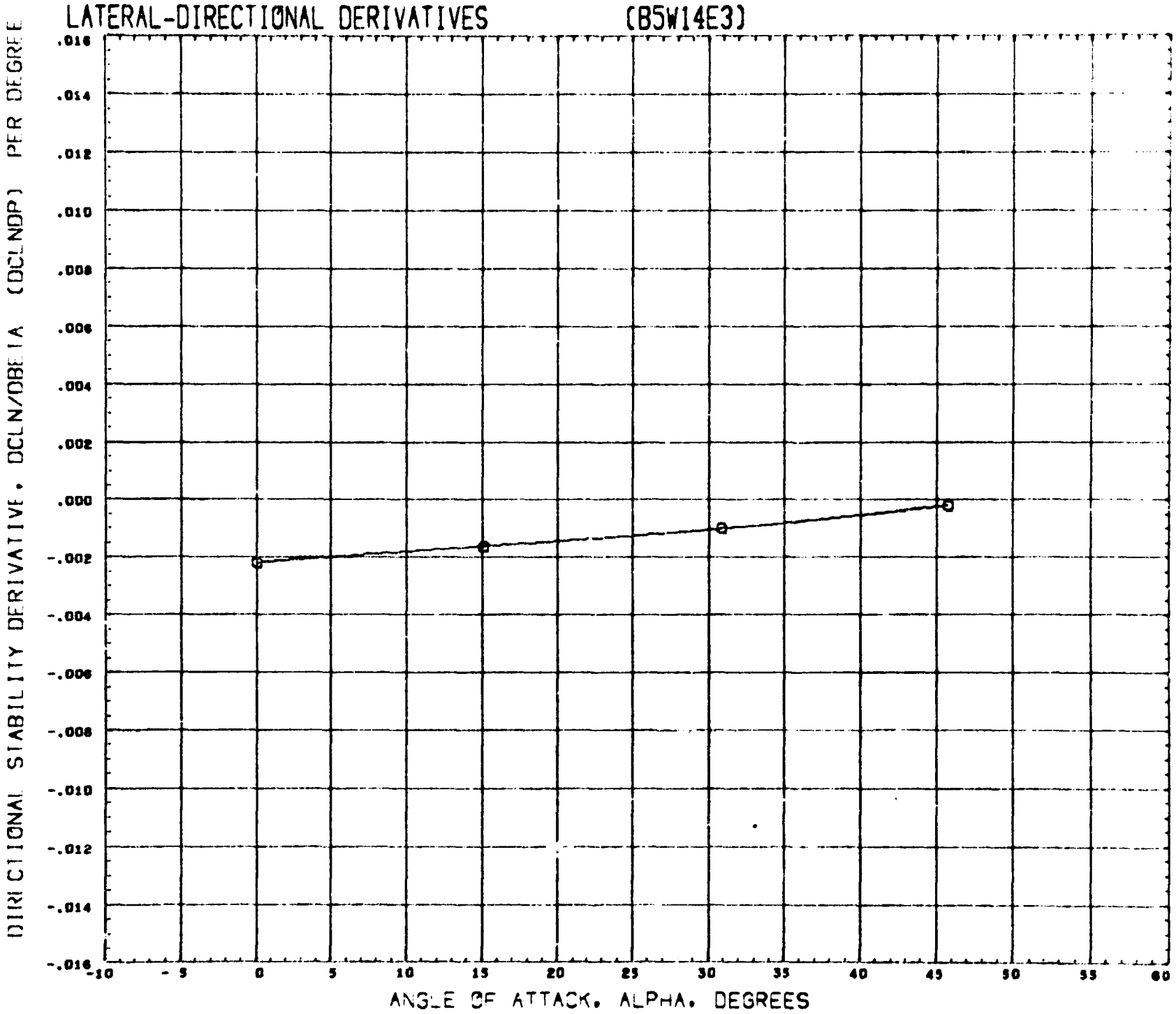


SYMBOL	MACH	PARAMETRIC VALUES			
O	9.000	ELVATR	0.000	AILRON	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.6740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

LATERAL-DIRECTIONAL DERIVATIVES (B5W14E3)

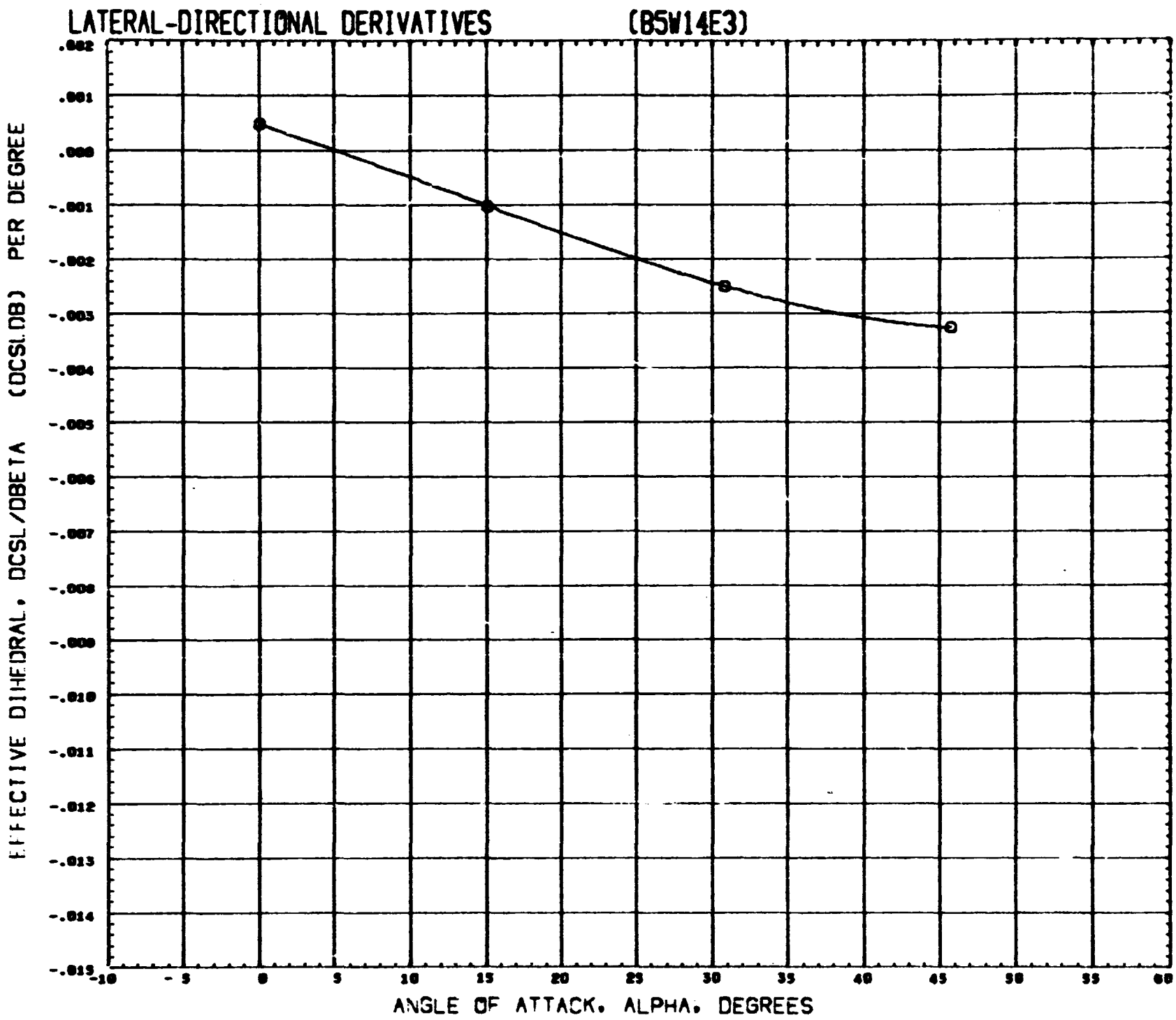


SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000

REFERENCE INFORMATION

RE.S	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

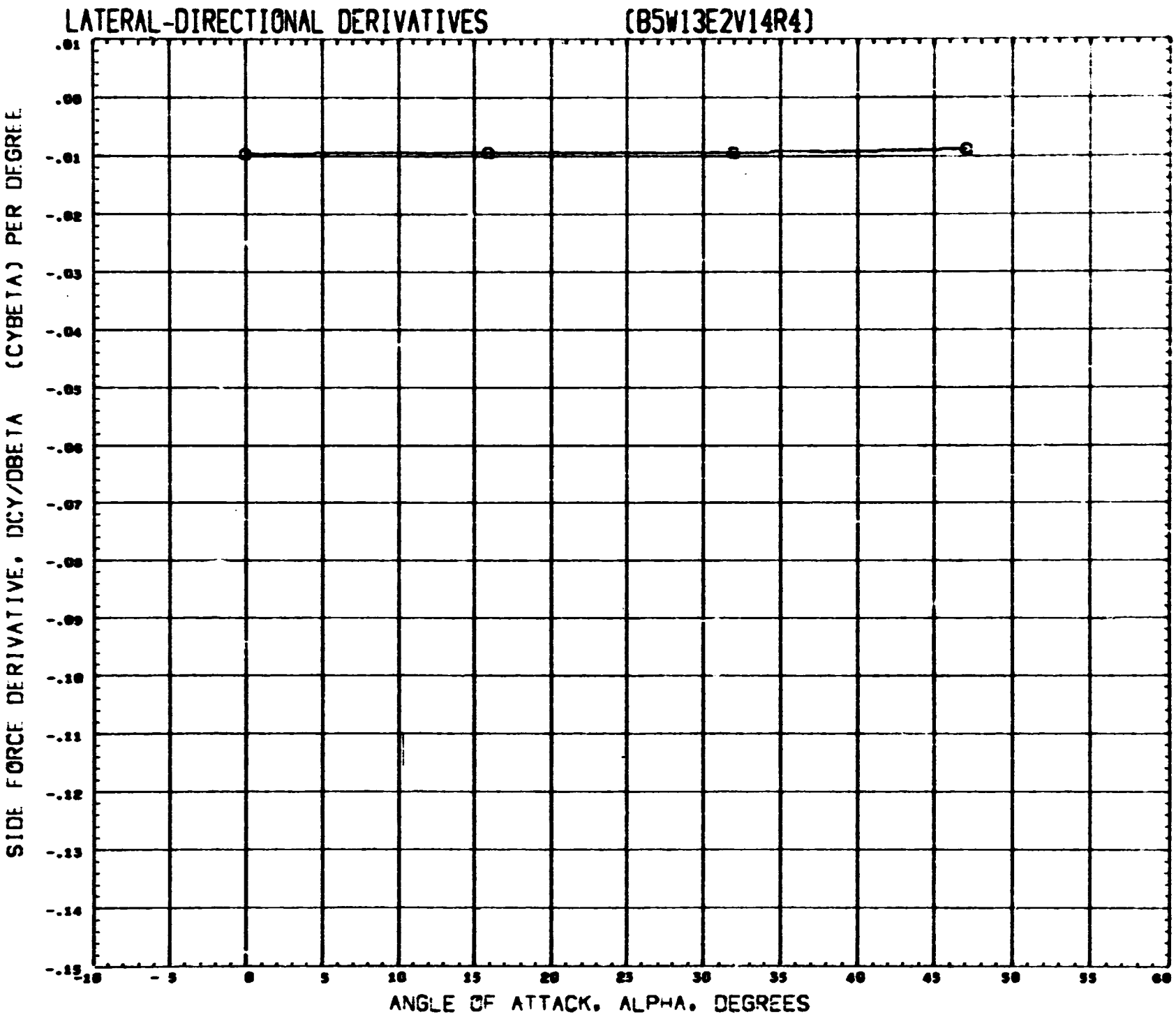
REFERENCE FILE NA 70 446



SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9000	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

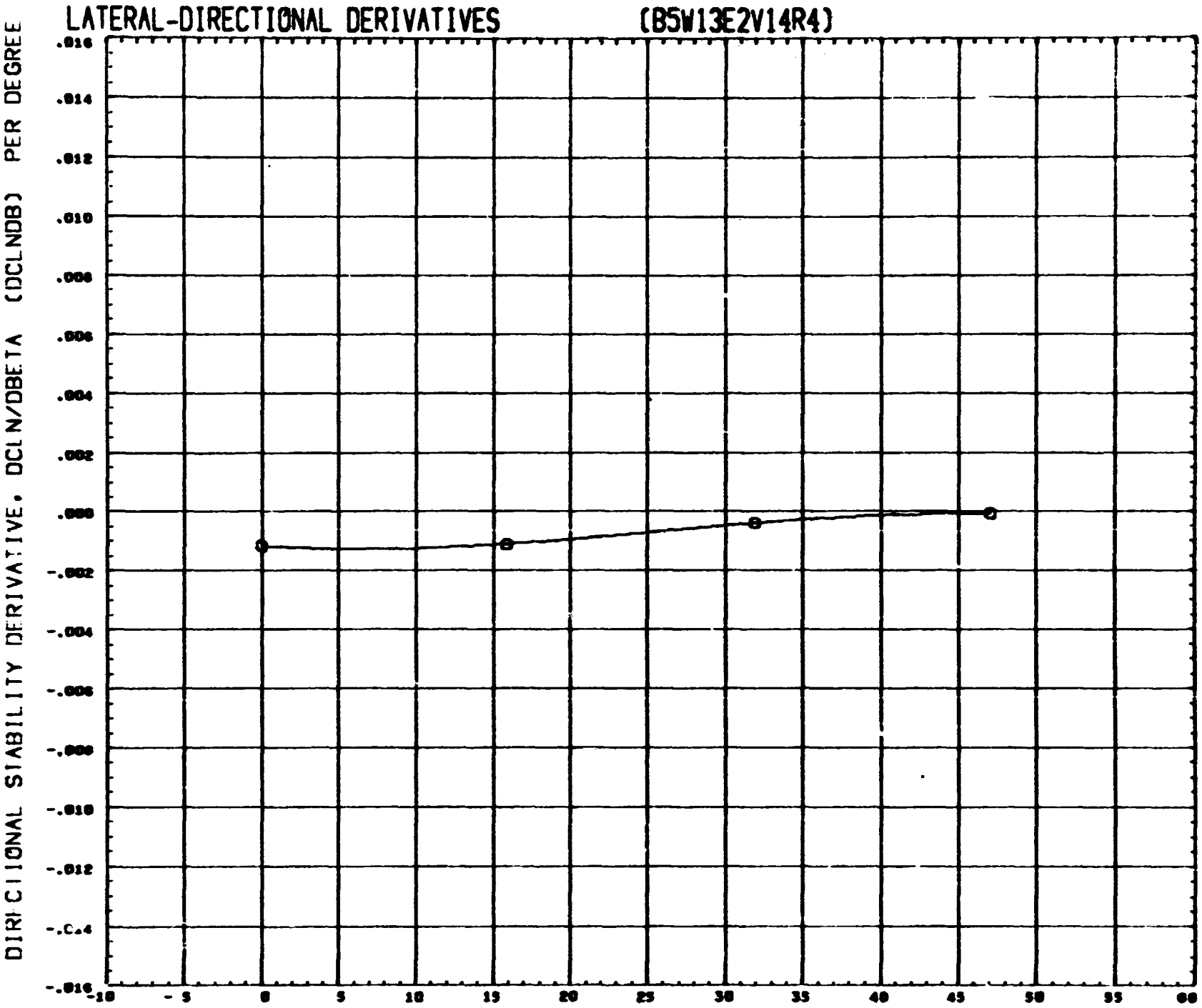
REFERENCE FILE NA 70 446



SYMBOL	MACH	PARAMETRIC VALUES			
O	5.003	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	0.000

REFERENCE FILE NA 70 446

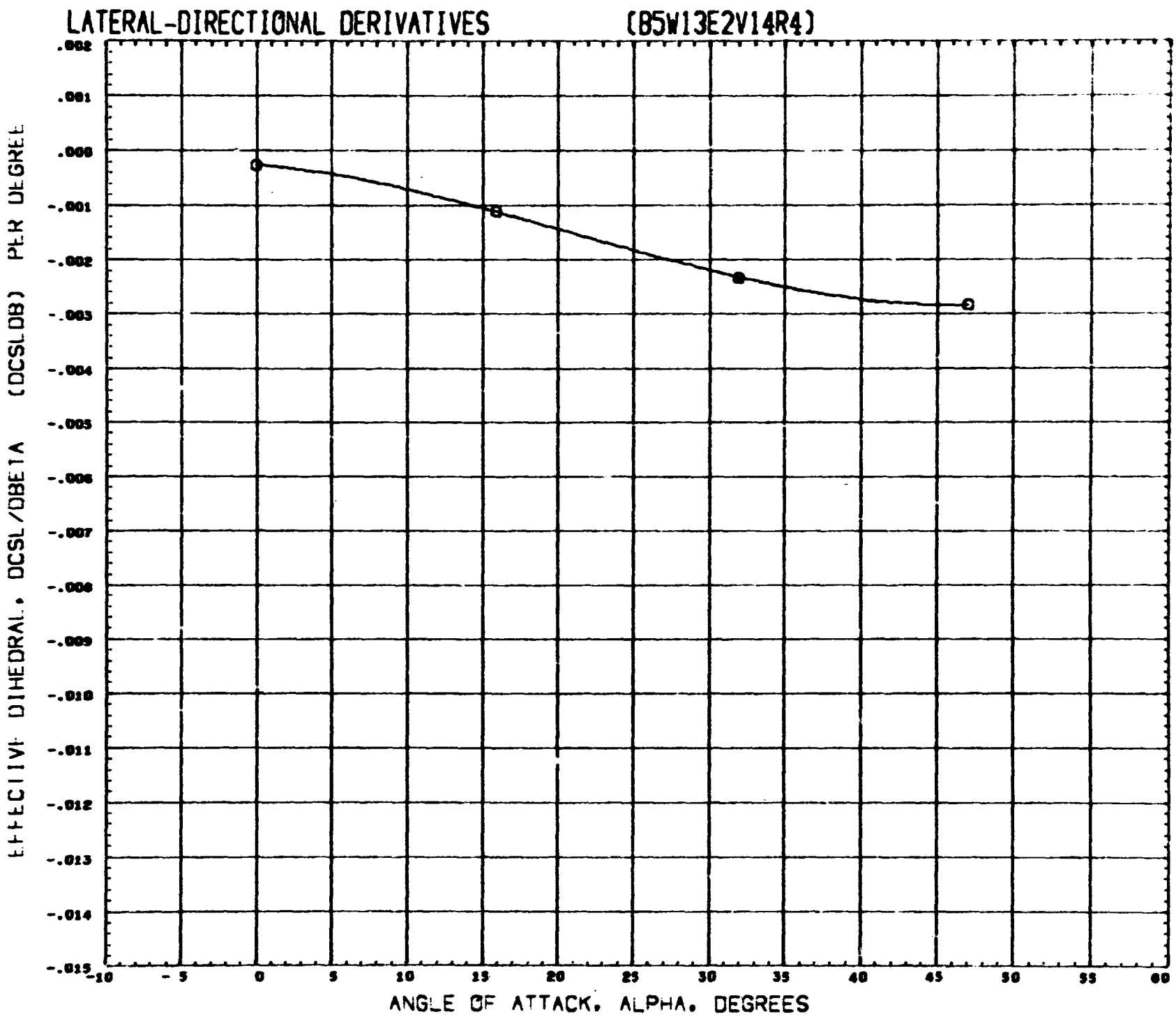
REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.0740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE



SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.0740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

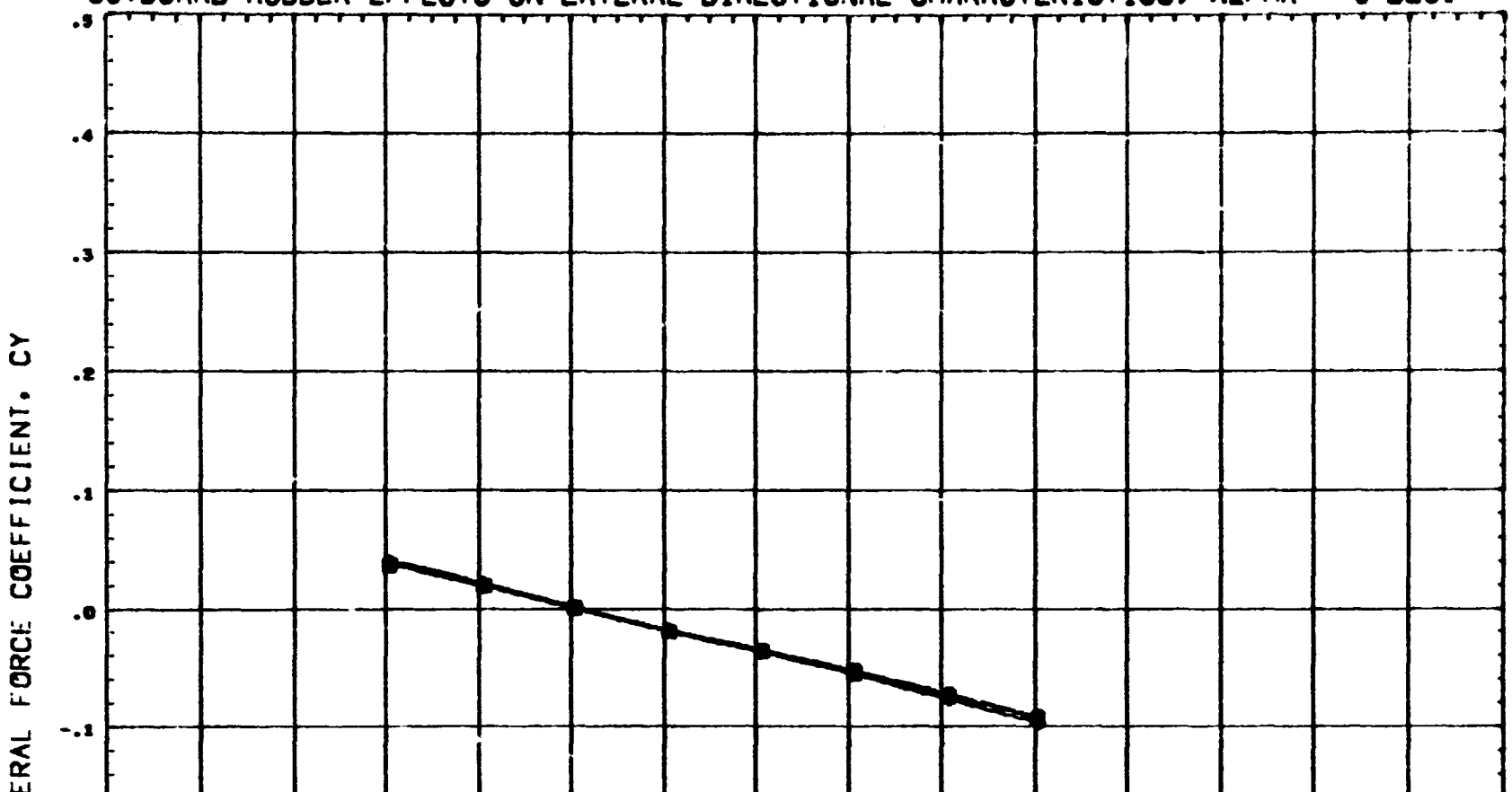


SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA = 0 DEG.

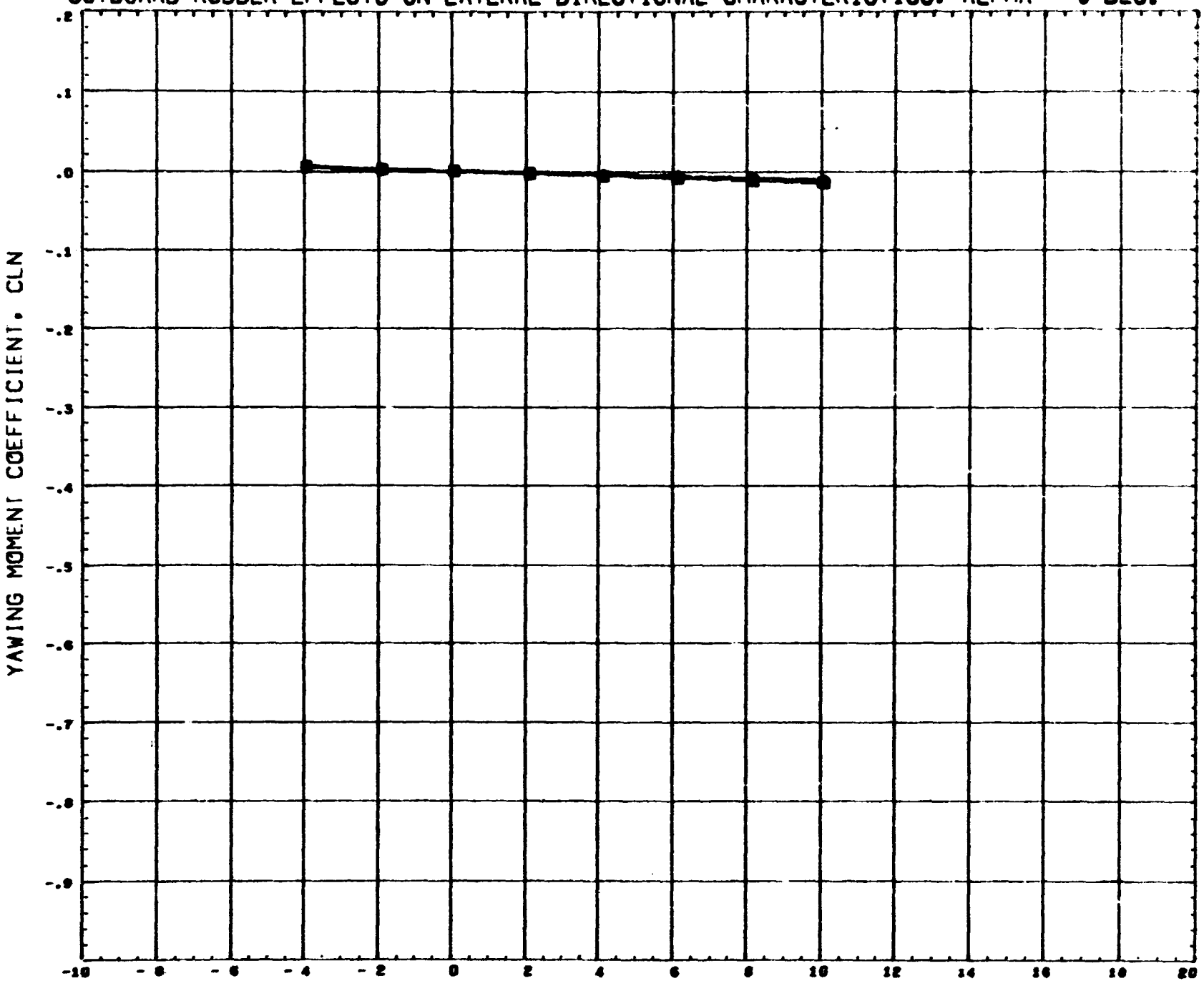


SYMBOL	VRTICL		PARAMETRIC VALUES		
○	0.000	MACH	4.960	ALPHA	- 0.070
□	10.000	ELVATR	0.000	AILRON	0.000
◇	20.000	RUDDER	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

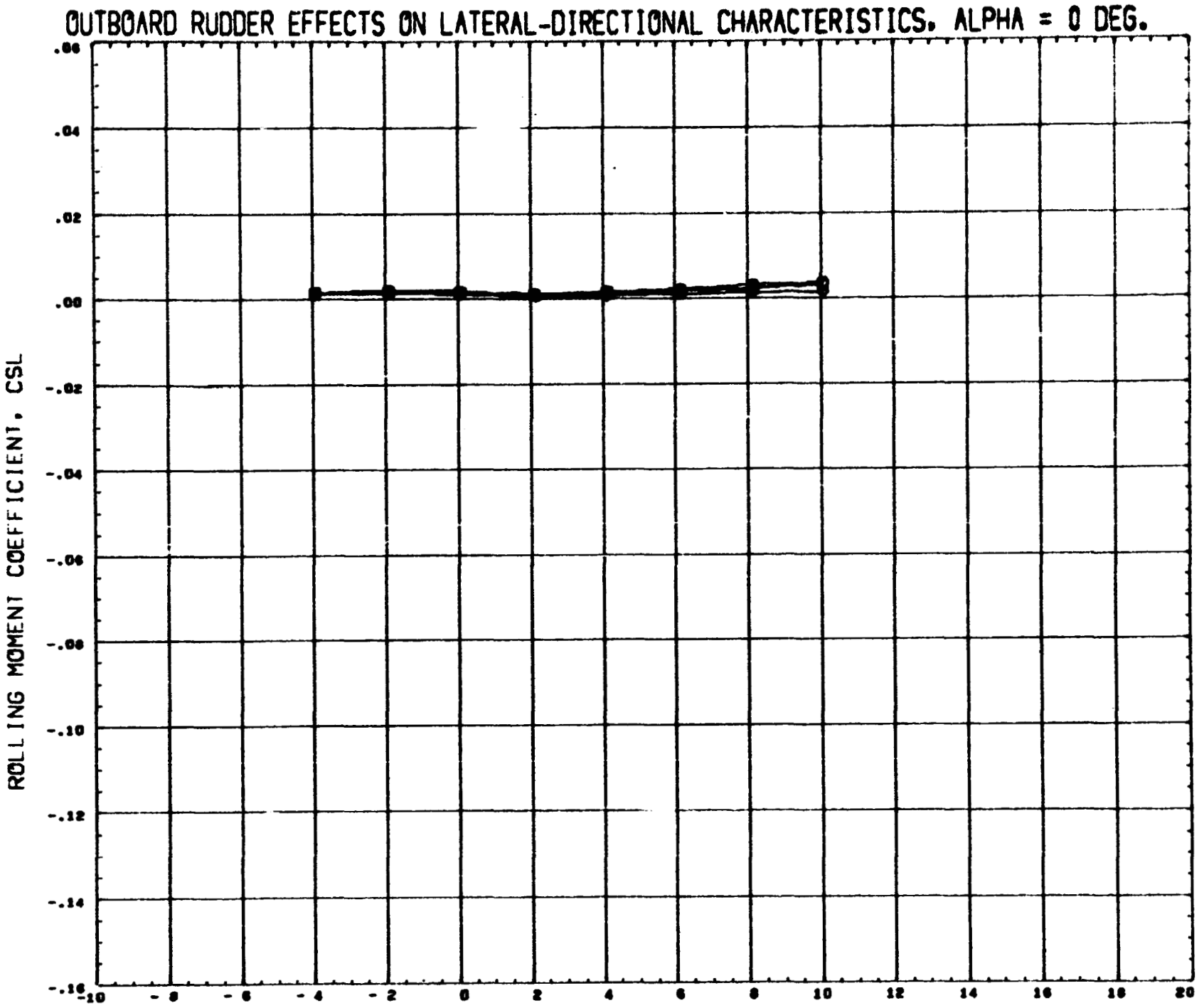
OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA = 0 DEG.



SYMBOL	VRTICL		PARAMETRIC VALUES		
○	0.000	MACH	4.960	ALPHA	- 0.870
□	10.000	ELVATR	0.000	AILRON	0.000
◇	20.000	RUDDER	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

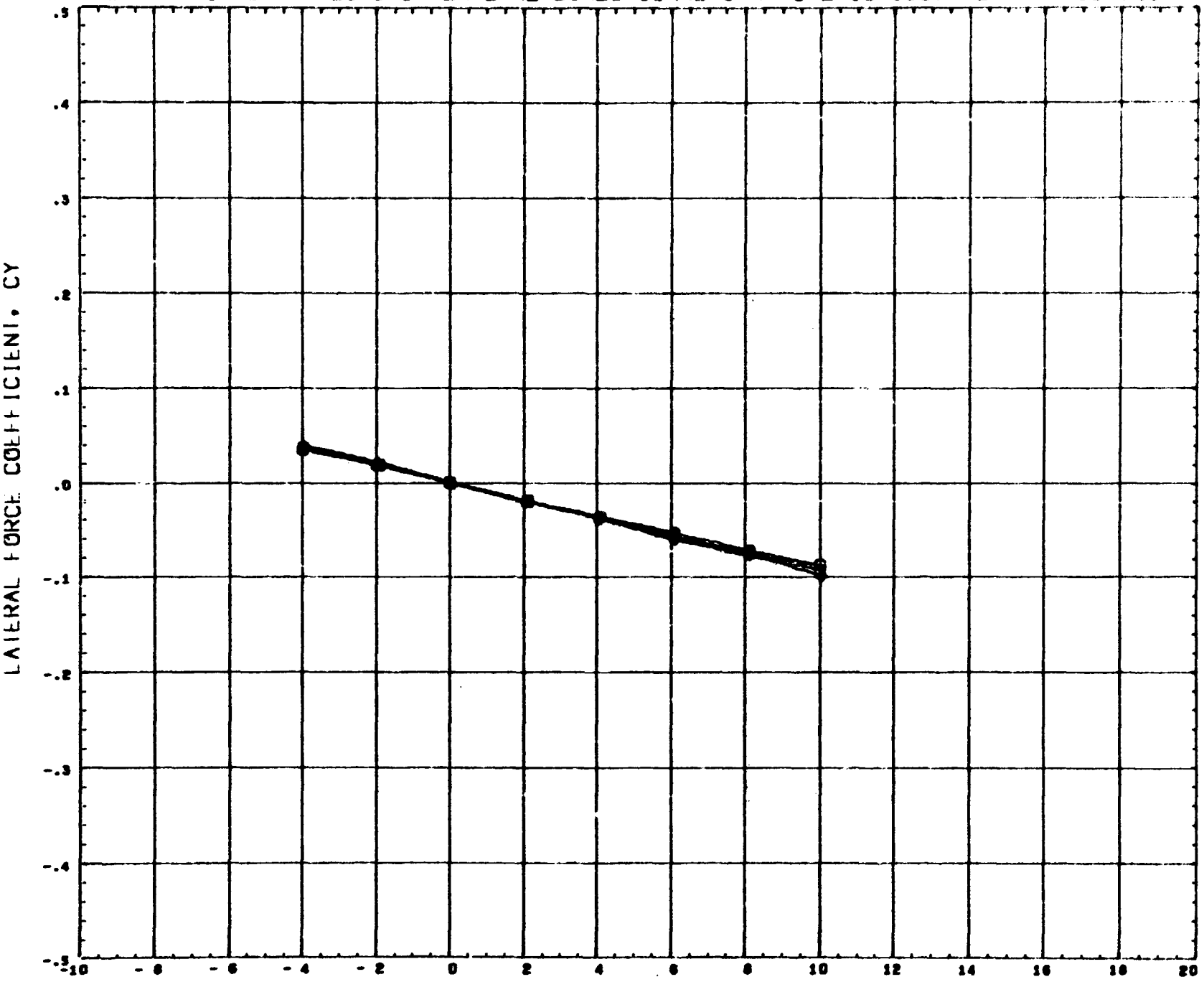


SYMBOL	VRTICL		PARAMETRIC VALUES		
○	0.000	MACH	4.960	ALPHA	- 0.070
□	10.000	ELVATR	0.000	AILRON	0.000
◇	20.000	RUDDER	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4559	INCHES
SCALE	0.0035	SCALE

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA = 15 DEG.

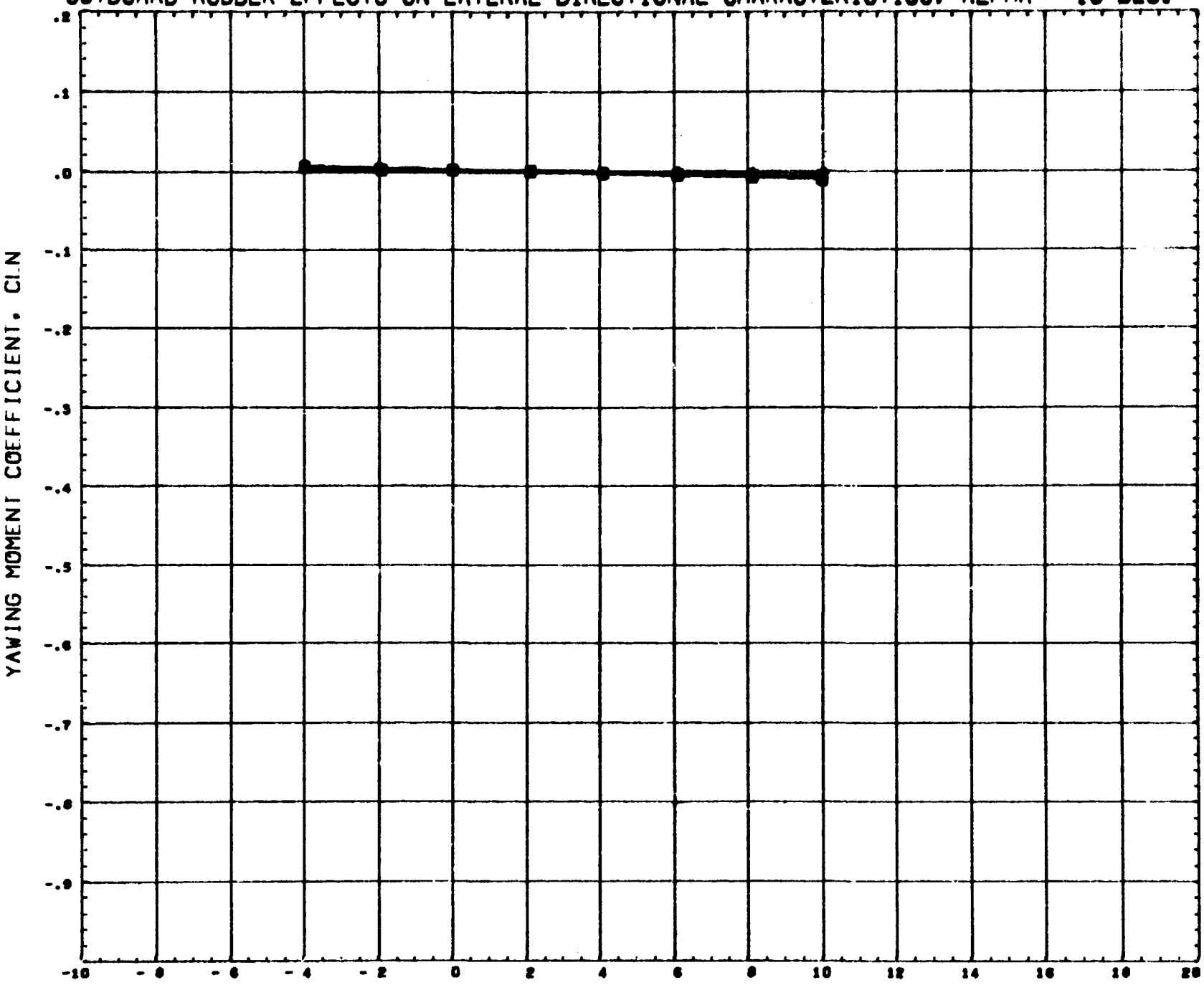


SYMBOL	VRTICL		PARAMETRIC VALUES		
□	0.000	MACH	4.960	ALPHA	15.840
○	10.000	ELVATR	0.000	AILRON	0.000
◇	20.000	RUDDER	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.6740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA = 15 DEG.

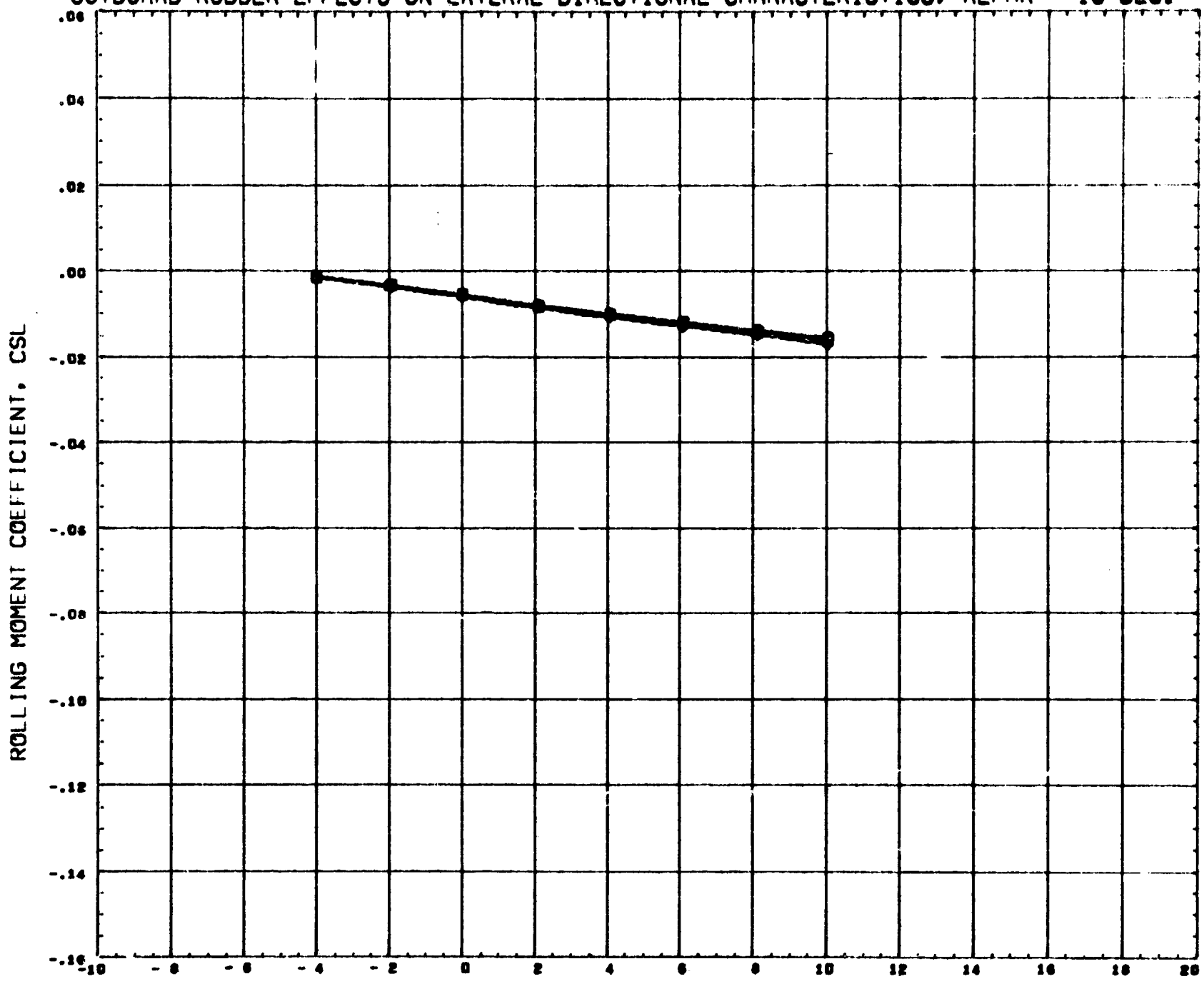


SYMBOL	VRTICL		PARAMETRIC VALUES		
○	0.000	MACH	4.960	ALPHA	15.840
□	10.000	ELVATR	0.000	AILRON	0.000
◇	20.000	RUDDER	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA = 15 DEG.

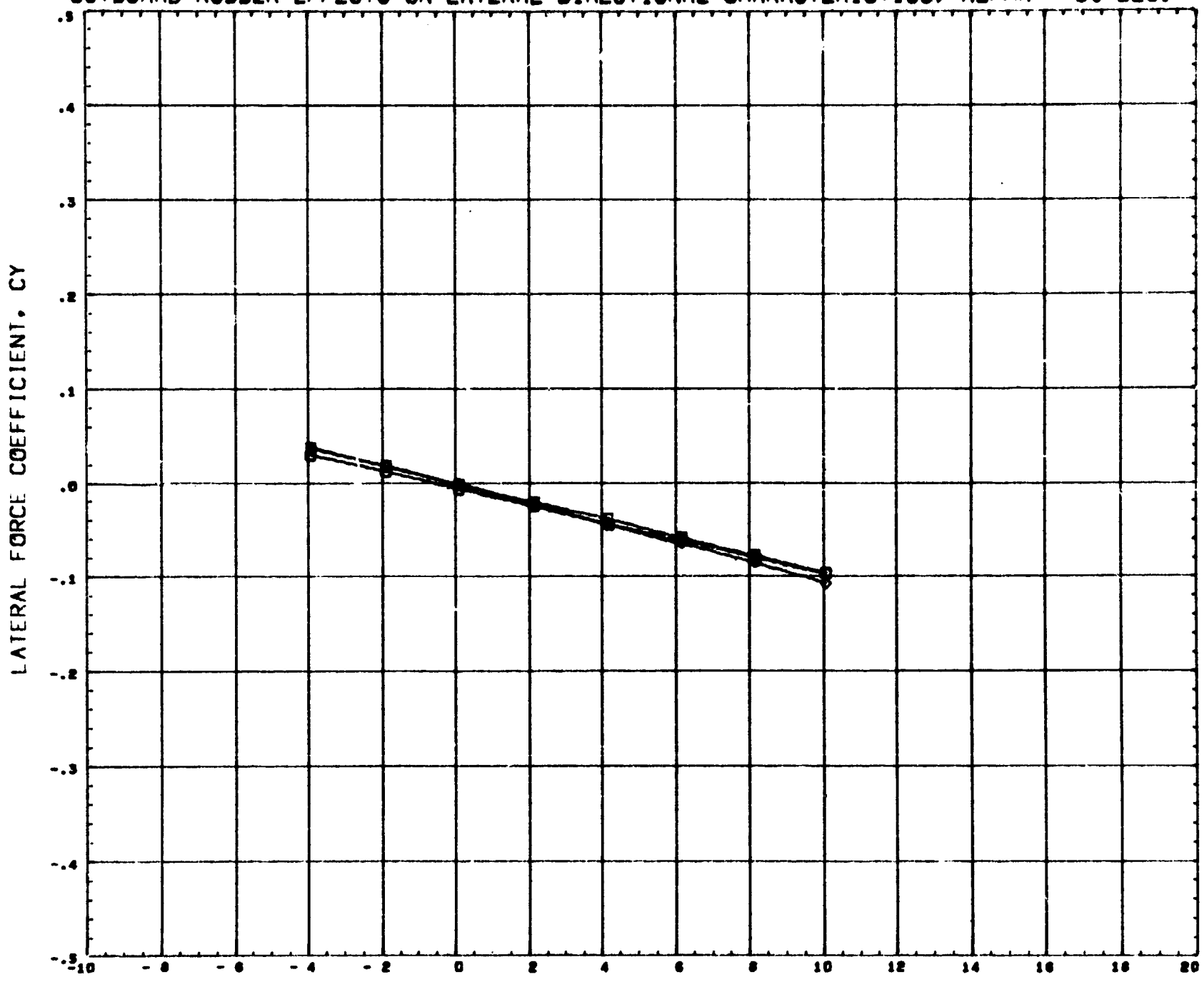


SYMBOL	VRTICL		PARAMETRIC VALUES		
○	0.000	MACH	4.960	ALPHA	15.040
□	10.000	ELVATR	0.000	AILRON	0.000
◇	20.000	RUDDER	0.000		

REFERENCE FILE NA 70 468

REFERENCE INFORMATION		
REFS	10.7320	88 INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA = 30 DEG.

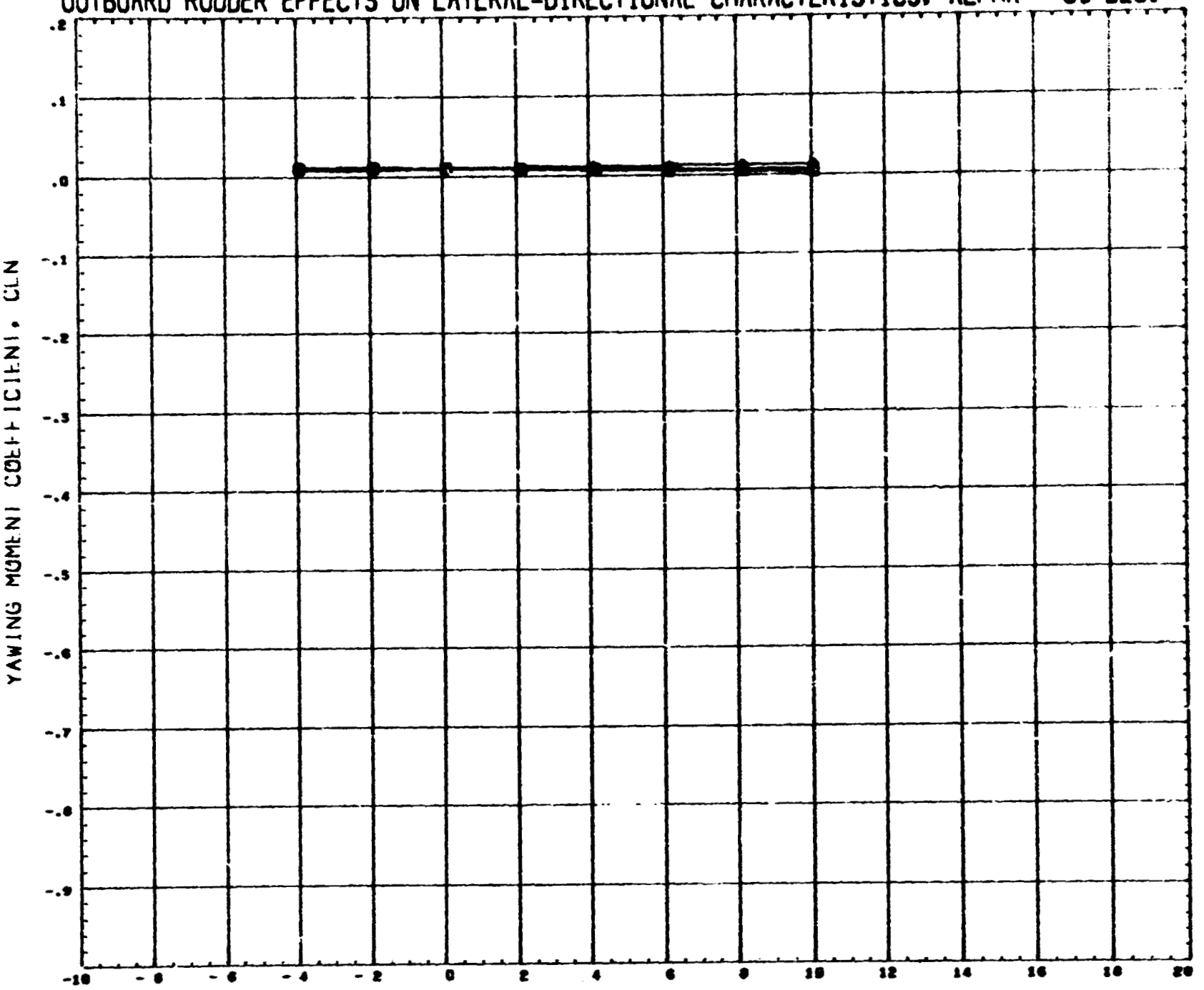


SYMBOL	VRTICL		PARAMETRIC VALUES		
○	0.000	MACH	4.960	ALPHA	31.920
□	10.000	ELVATR	0.000	AILRON	0.000
◇	20.000	RUDDER	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	88 INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA = 30 DEG.

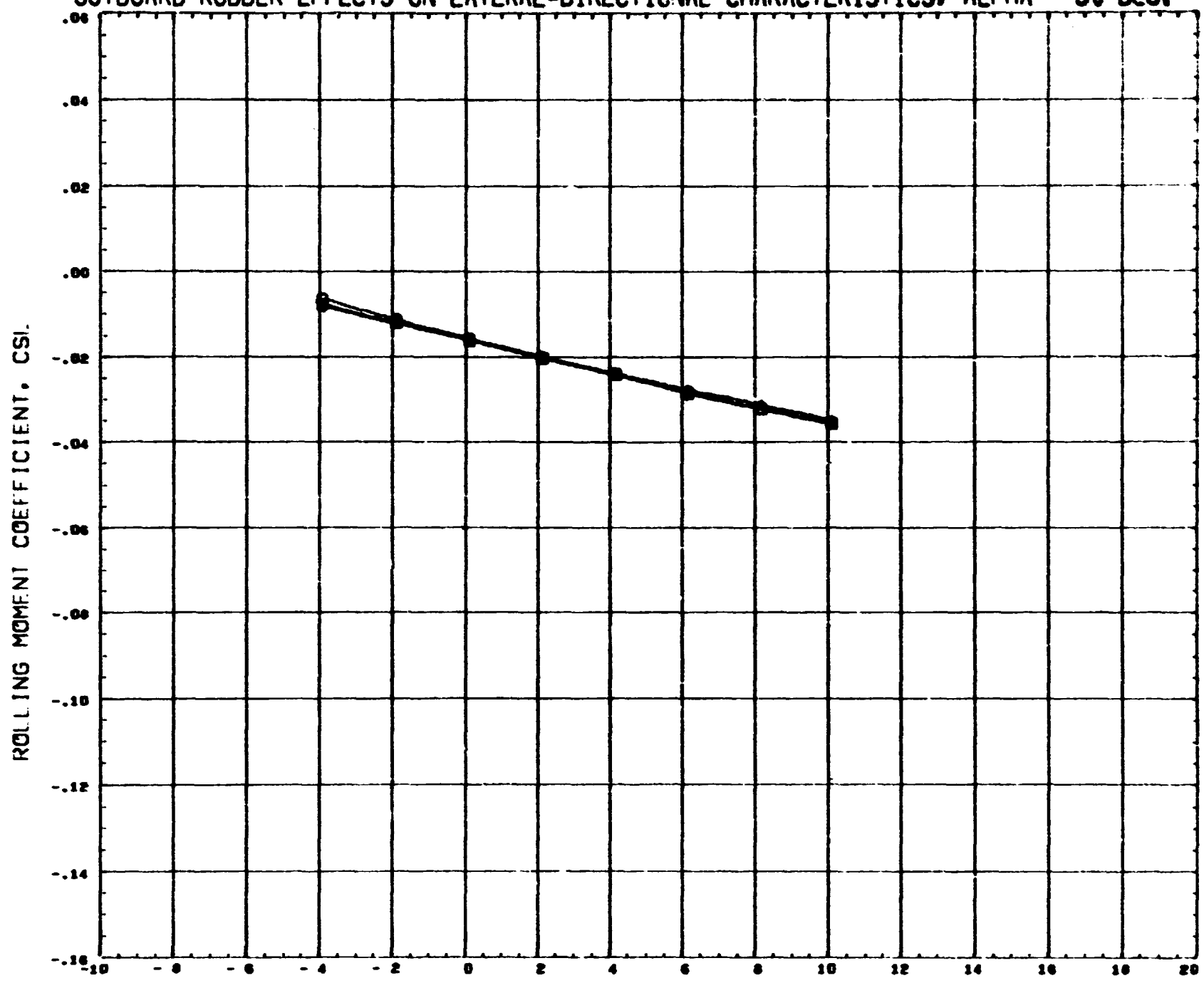


SYMBOL	VRTICL		PARAMETRIC VALUES		
□	0.000	MACH	4.960	ALPHA	31.920
○	10.000	ELVATR	0.000	AILRON	0.000
◇	20.000	RUDDER	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.6740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA = 30 DEG.

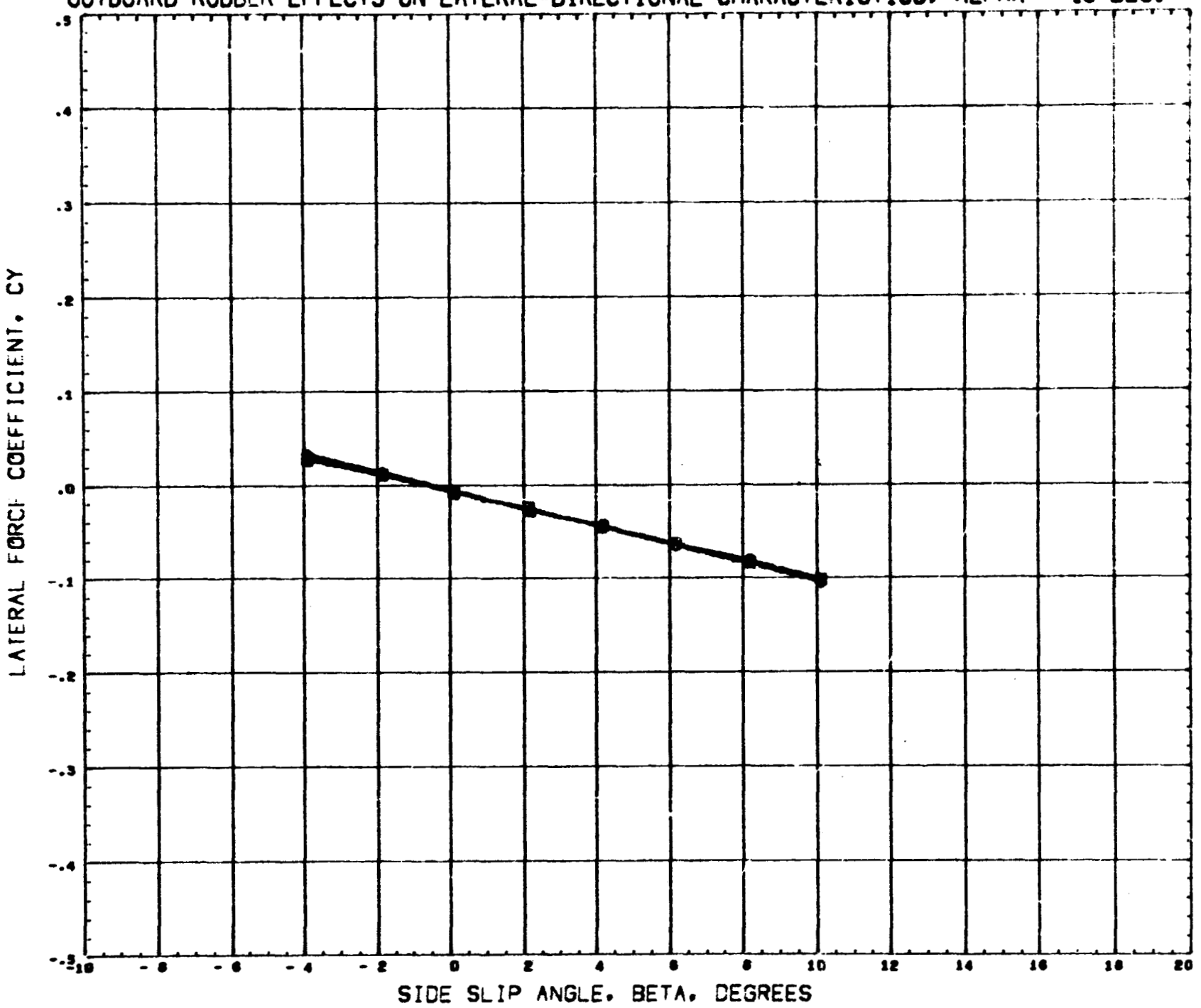


SYMBOL	VRTICL		PARAMETRIC VALUES		
○	0.000	MACH	4.960	ALPHA	31.920
□	10.000	ELVATR	0.000	AILRON	0.000
◇	20.000	RUDDER	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA = 45 DEG.

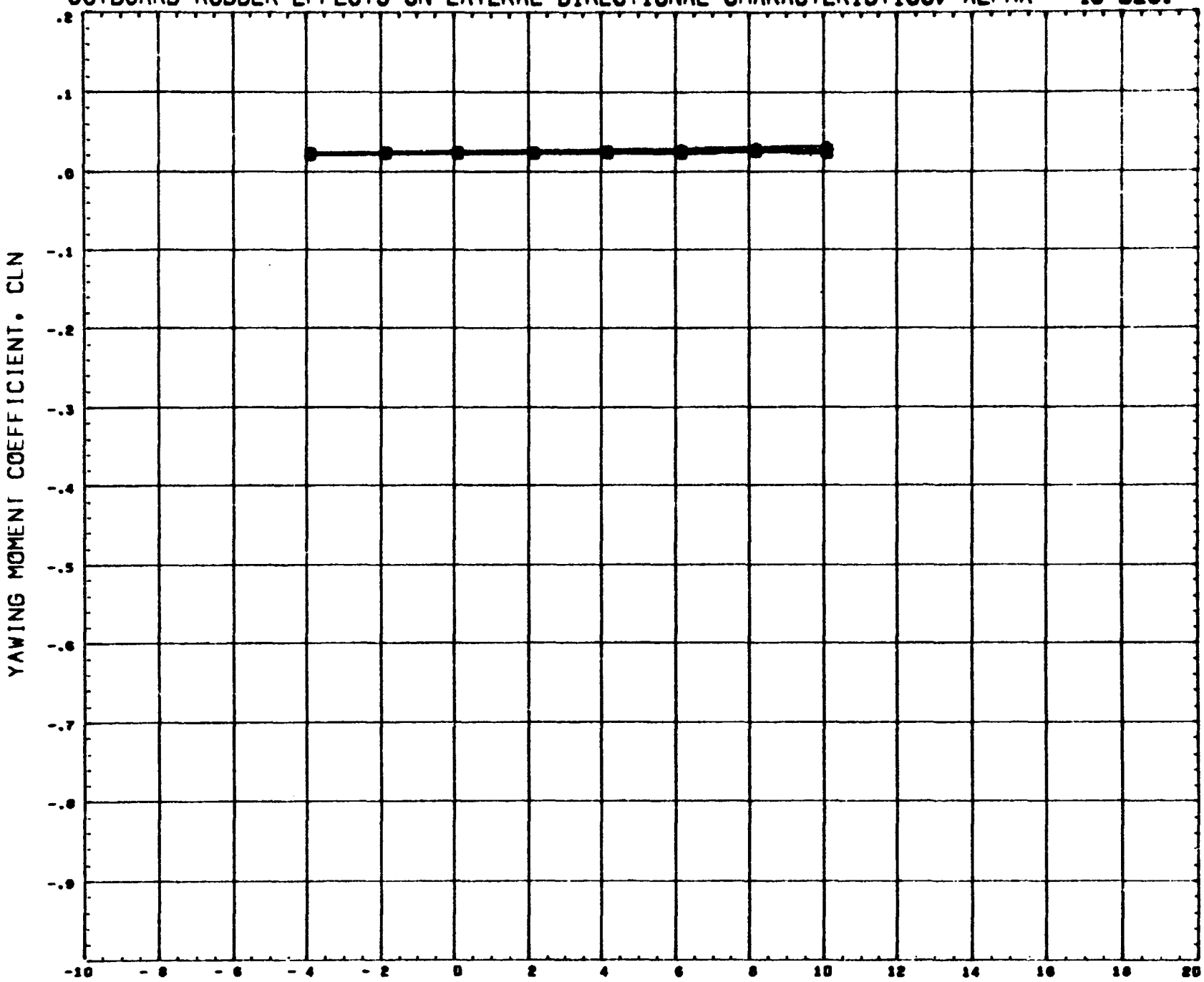


SYMBOL	VRTICL		PARAMETRIC VALUES		
○	0.000	MACH	4.960	ALPHA	47.000
□	10.000	ELVATR	0.000	AILRON	0.000
◇	20.000	RUDDER	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9600	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.6550	INCHES
SCALE	0.0035	SCALE

OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS. ALPHA = 45 DEG.

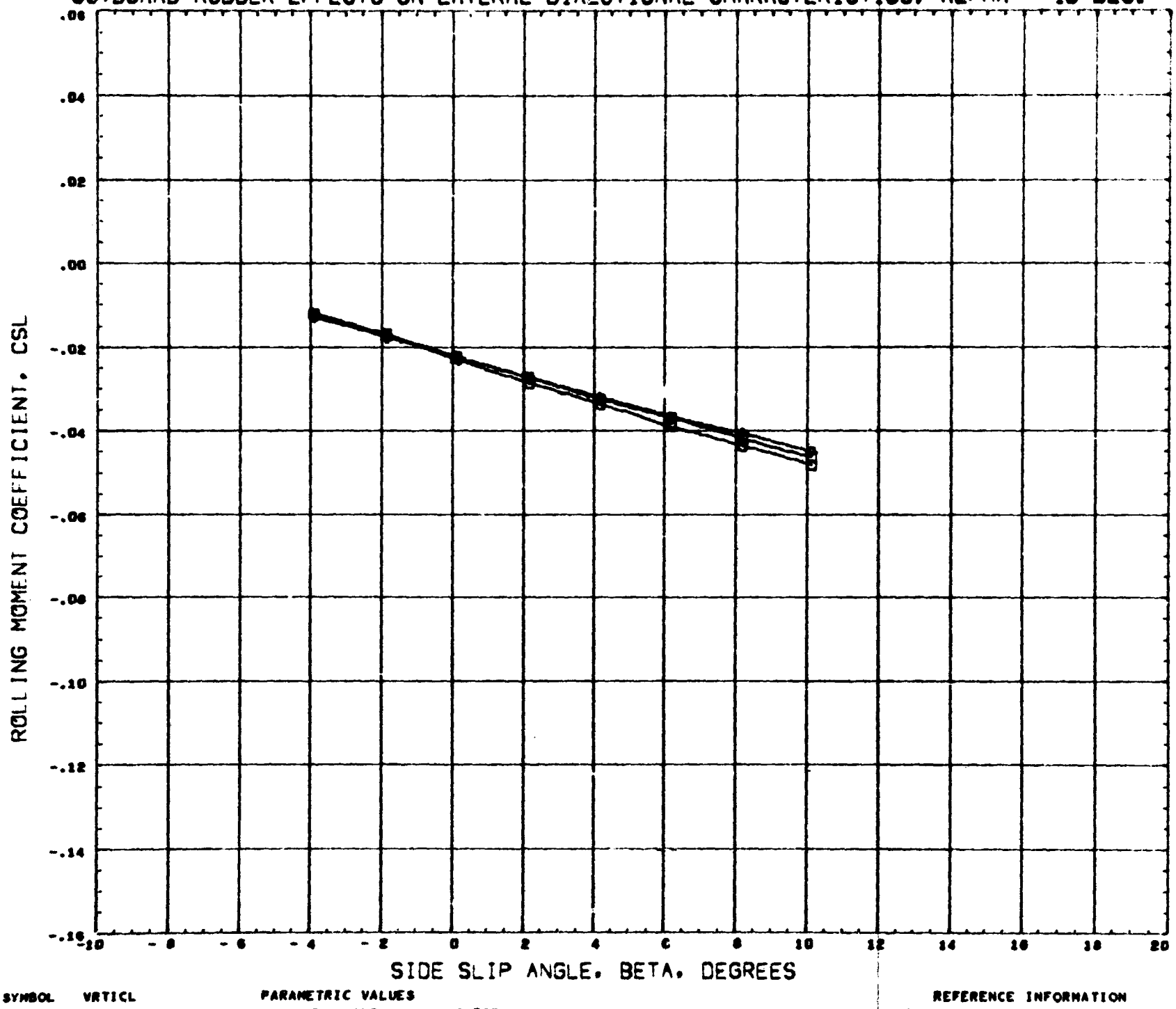


SYMBOL	VRTICL		PARAMETRIC VALUES		
○	0.000	MACH	4.960	ALPHA	47.080
□	10.000	ELVATR	0.000	AILRON	0.000
◇	20.000	RUDDER	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	3.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

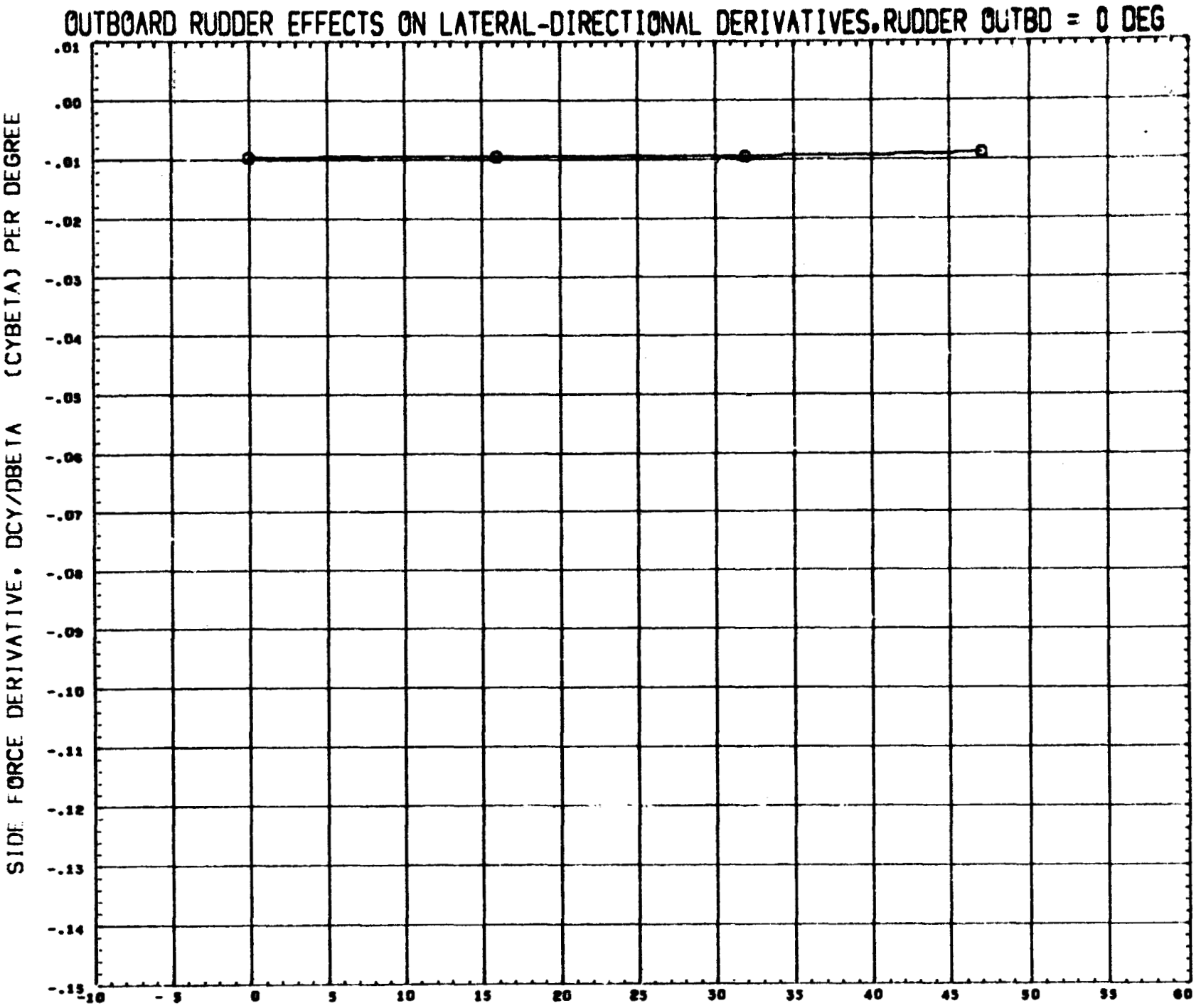
OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL CHARACTERISTICS, ALPHA = 45 DEG.



SYMBOL	VRTICL		PARAMETRIC VALUES		
○	0.000	MACH	4.960	ALPHA	47.080
□	10.000	ELVATR	0.000	AILRON	0.000
◇	20.000	RUDDER	0.000		

REFERENCE FILE NA 70 446

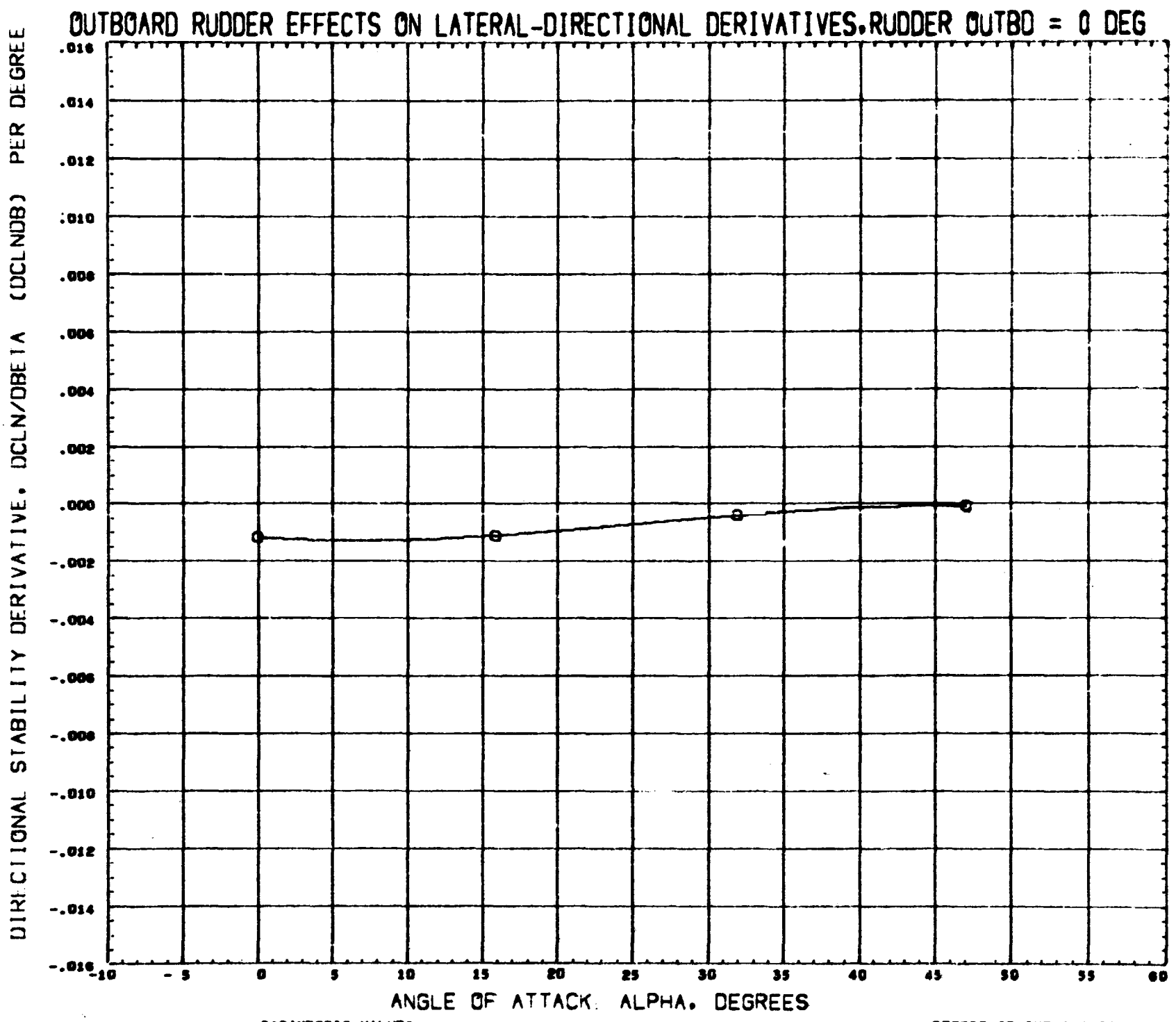
REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.6740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE



SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	0.000

REFERENCE FILE NA 70 446

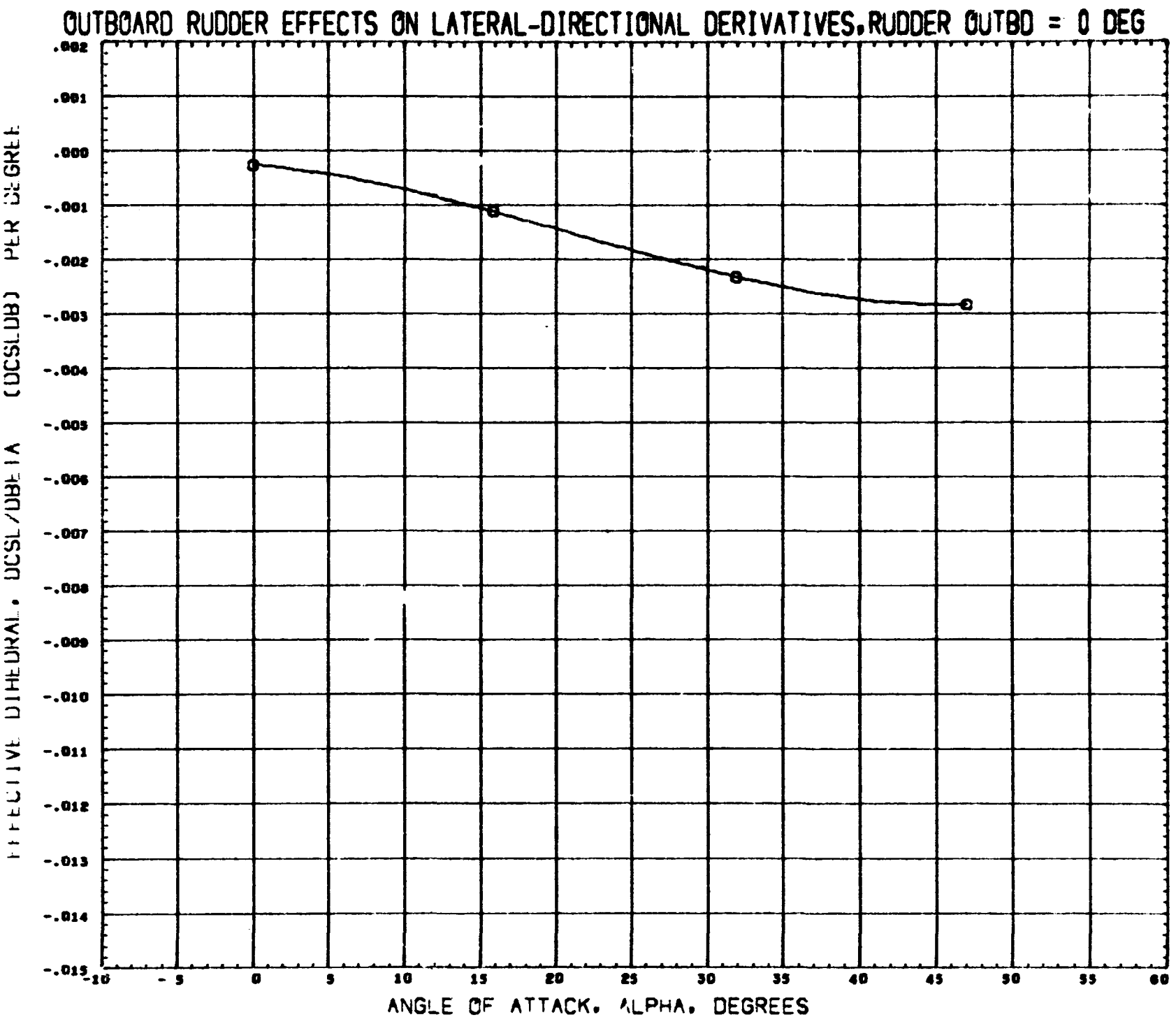
REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE



SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	0.000

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

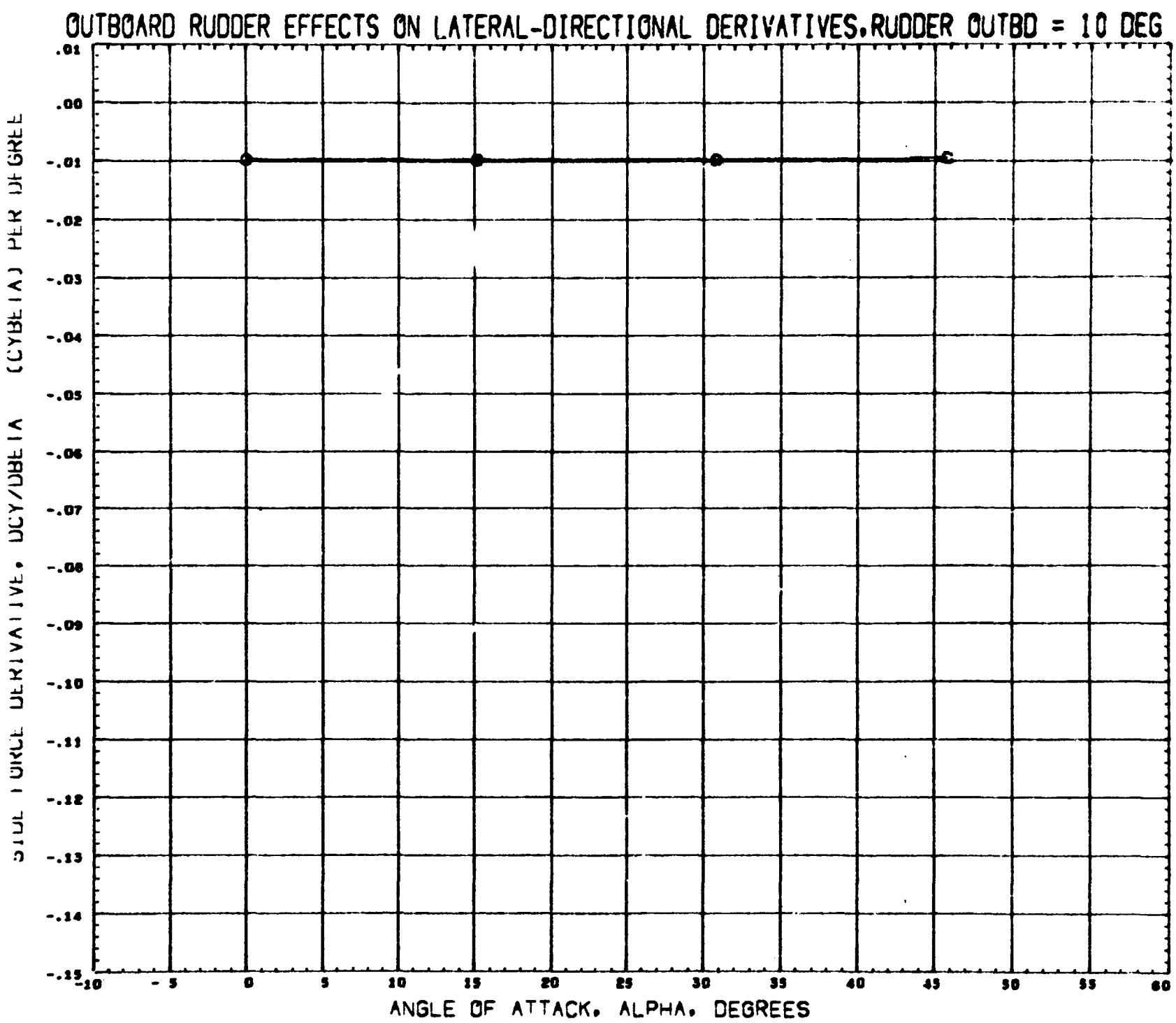
REFERENCE FILE NA 70 446



SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	0.000

REFERENCE FILE NA 70 446

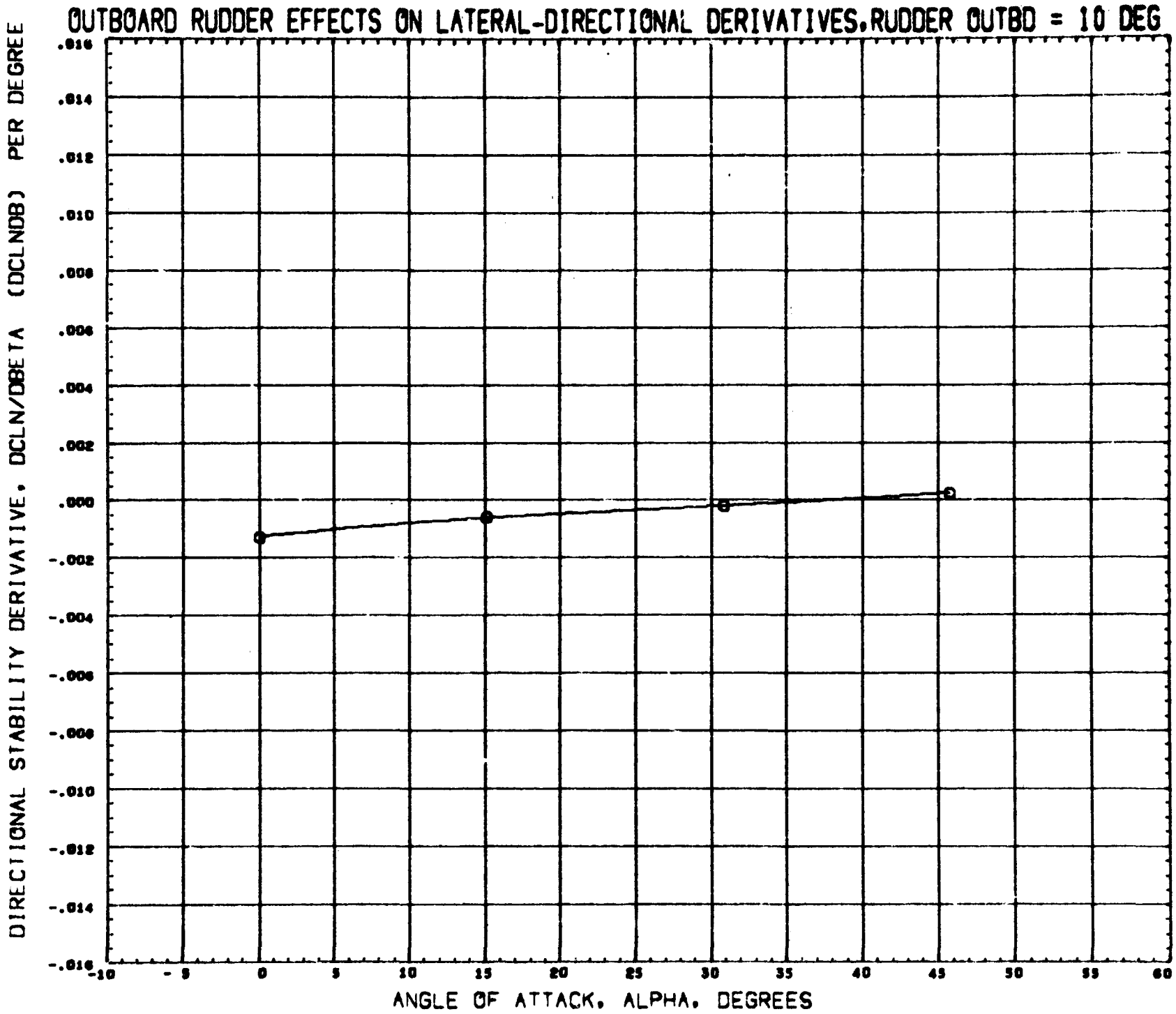
REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE



MBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	10.000

REFERENCE FILE NA 70 446

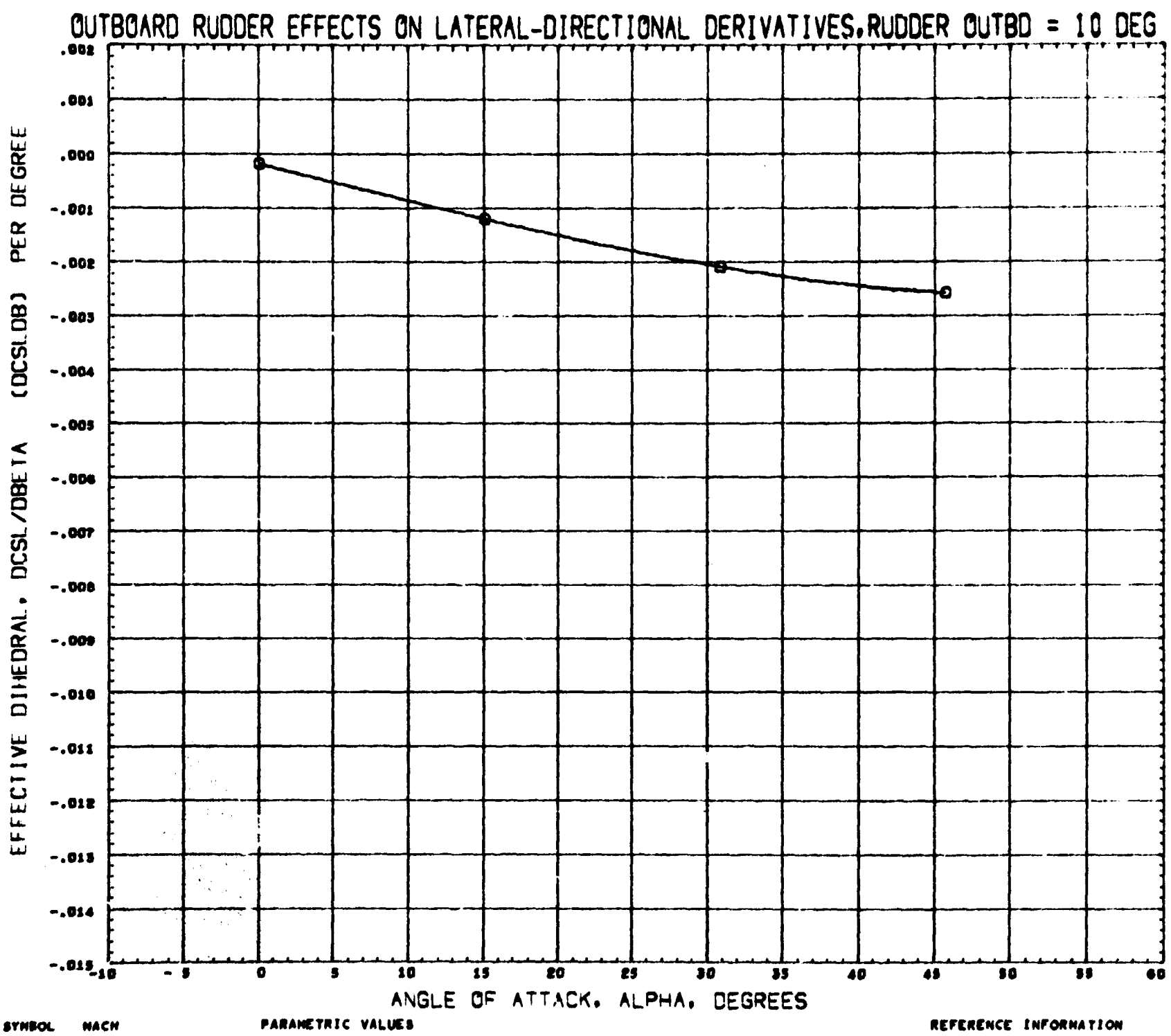
REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9000	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE



SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	10.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

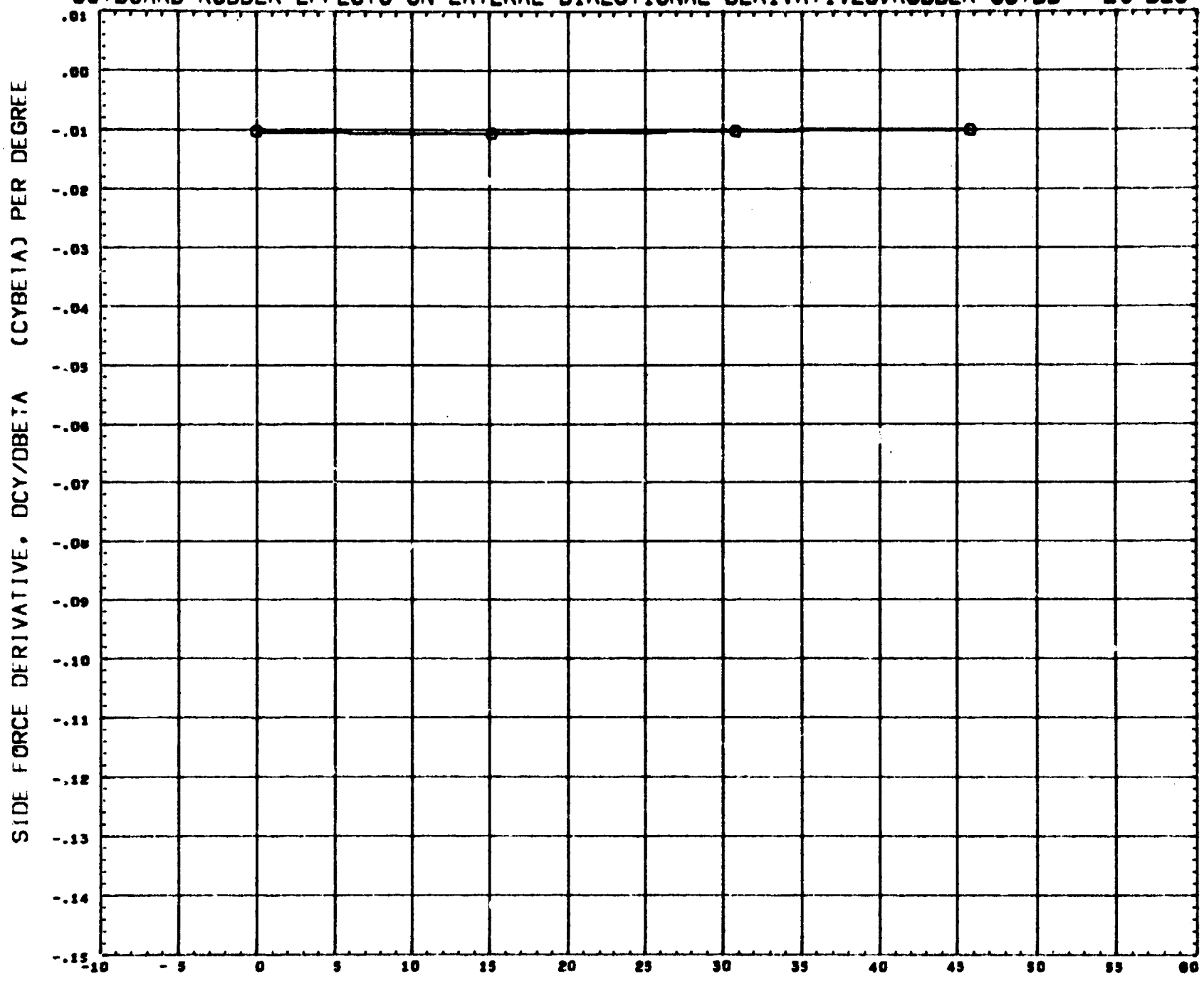


SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	10.000

REFERENCE FILE NA 70 448

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4950	INCHES
SCALE	0.0035	SCALE

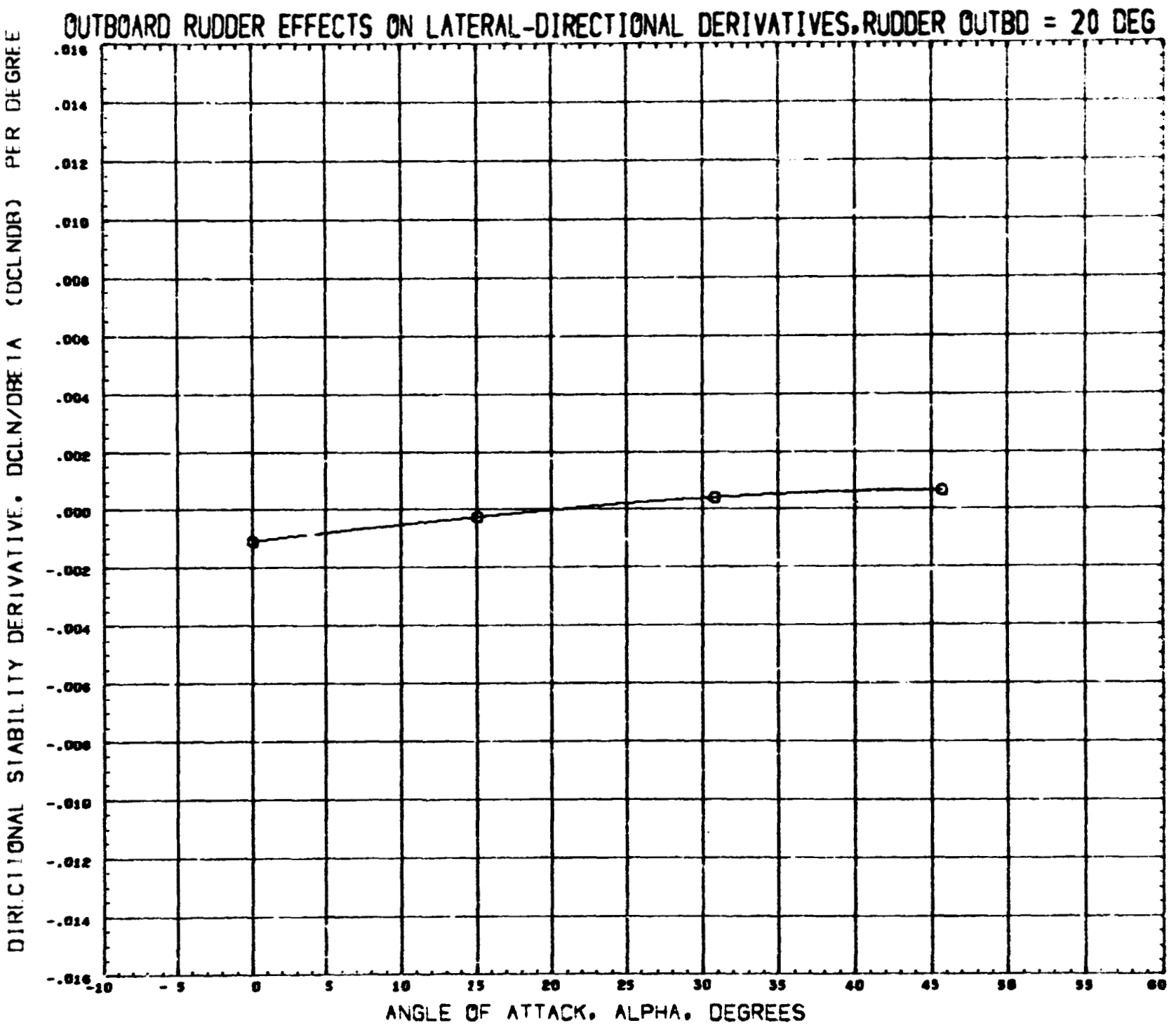
OUTBOARD RUDDER EFFECTS ON LATERAL-DIRECTIONAL DERIVATIVES.RUDDER OUTBD = 20 DEG



SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	20.000

REFERENCE FILE NA 70 446

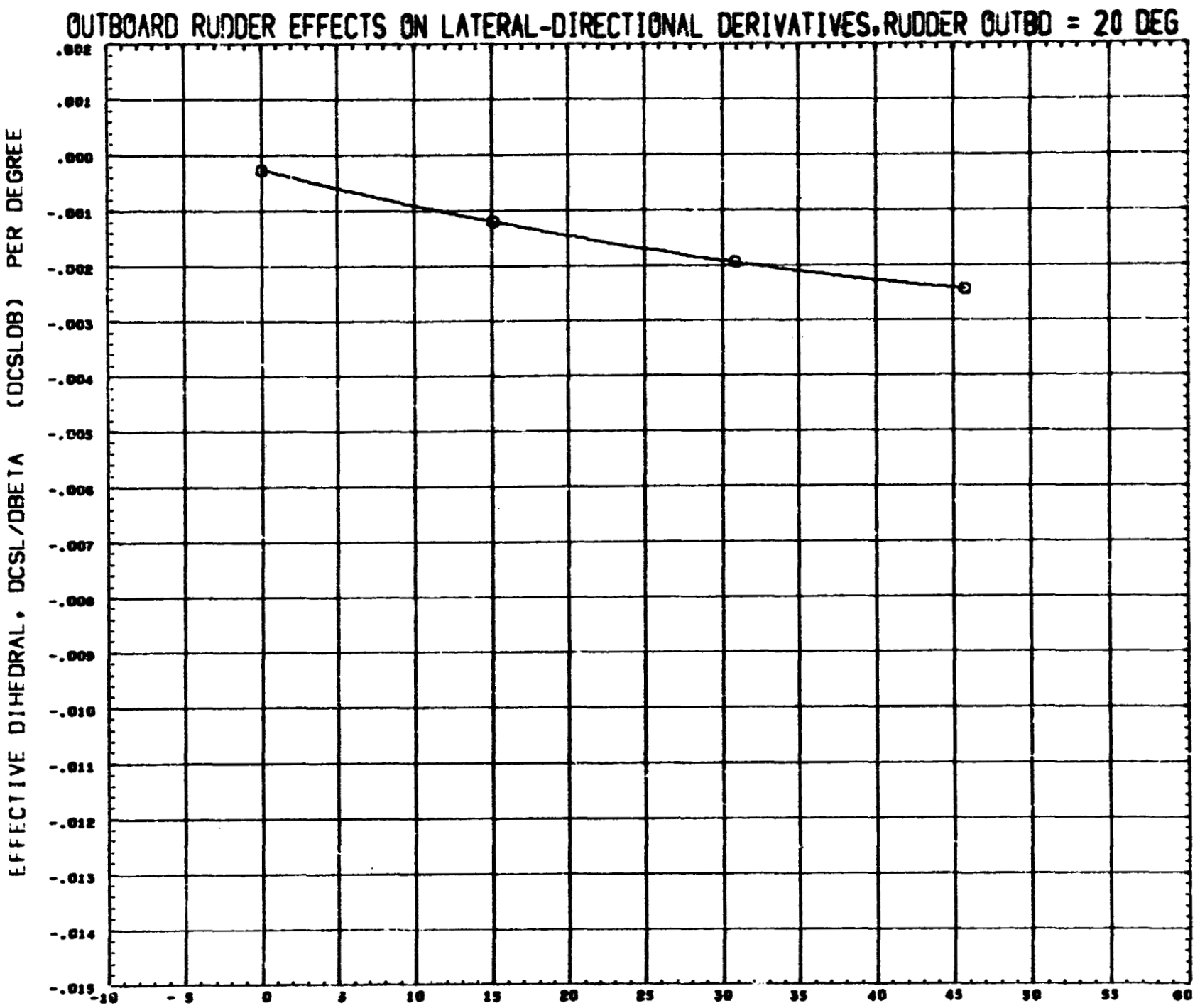
REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE



SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	20.000

REFERENCE FILE NA 70 445

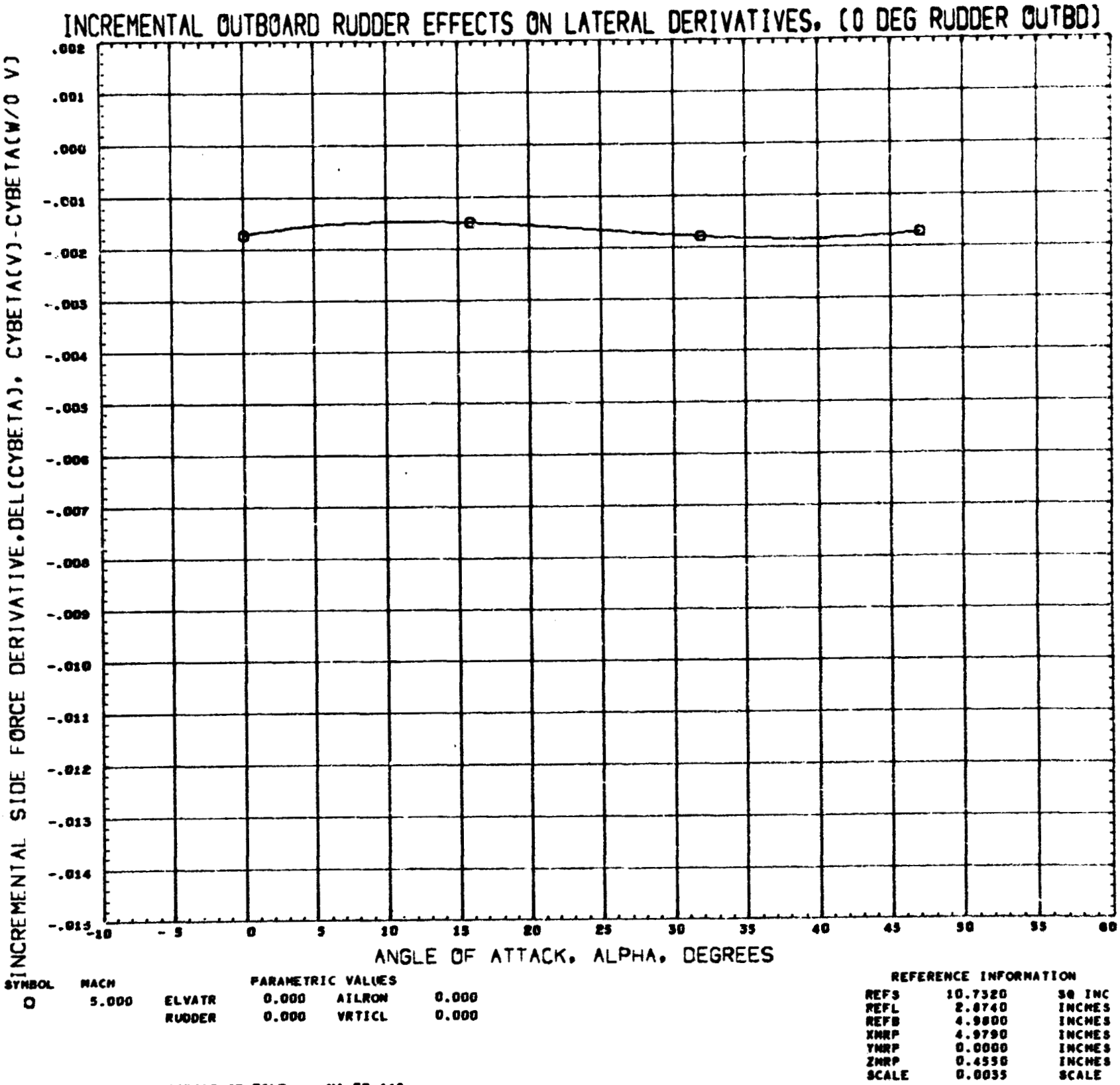
REFERENCE INFORMATION		
REFS	10.7320	SQ INCHES
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

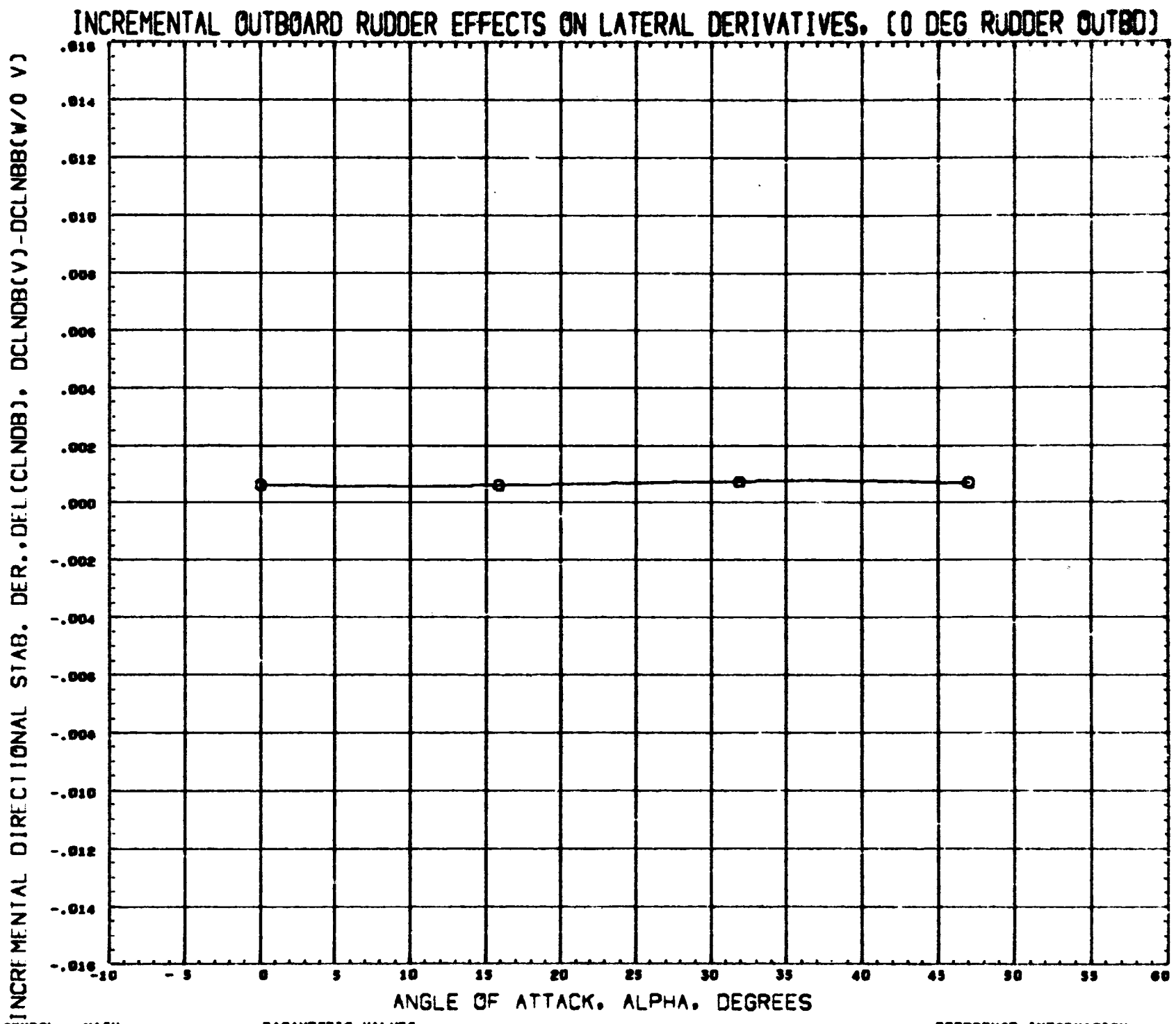


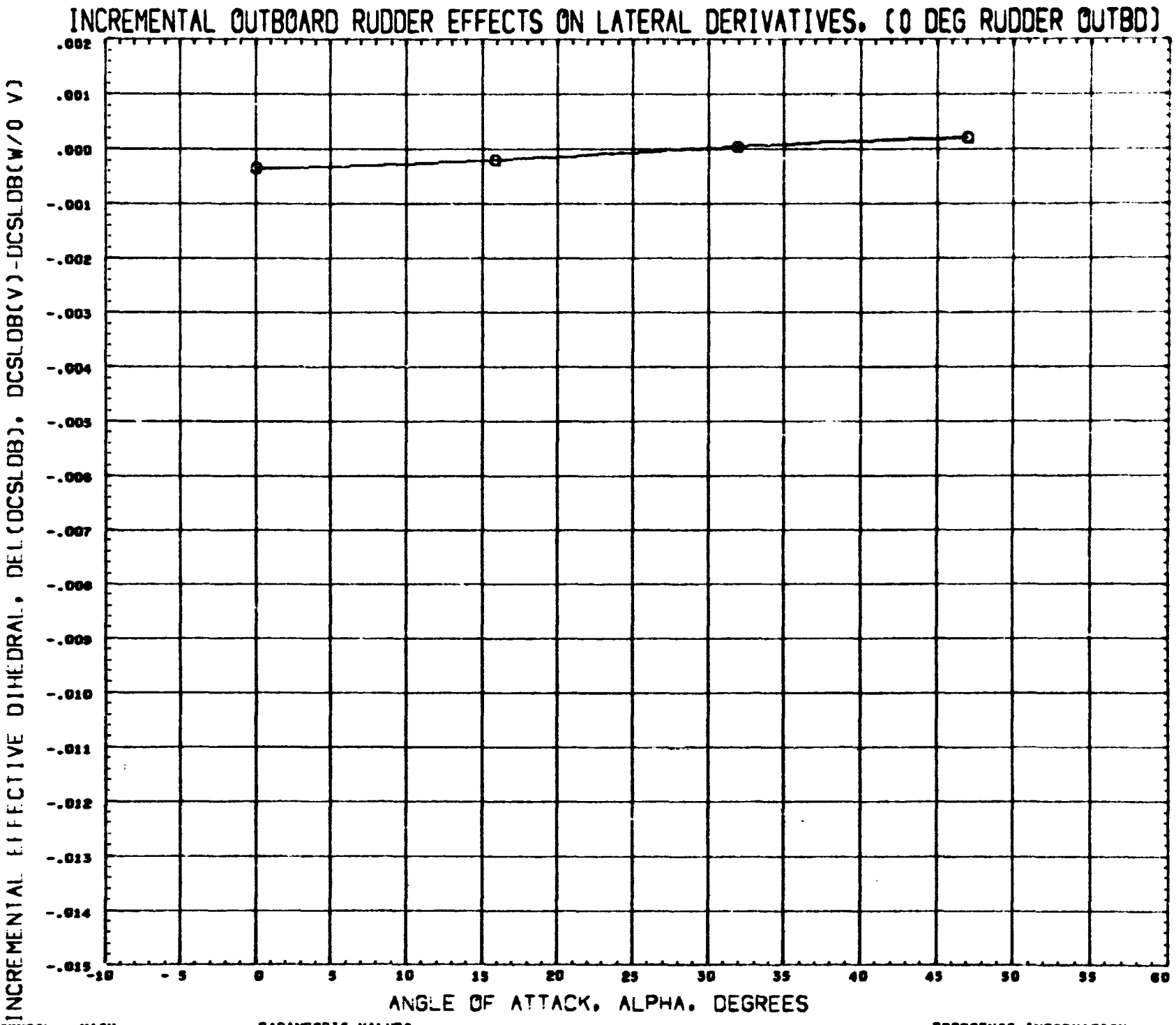
SYMBOL	MACH		PARAMETRIC VALUES		
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	20.000

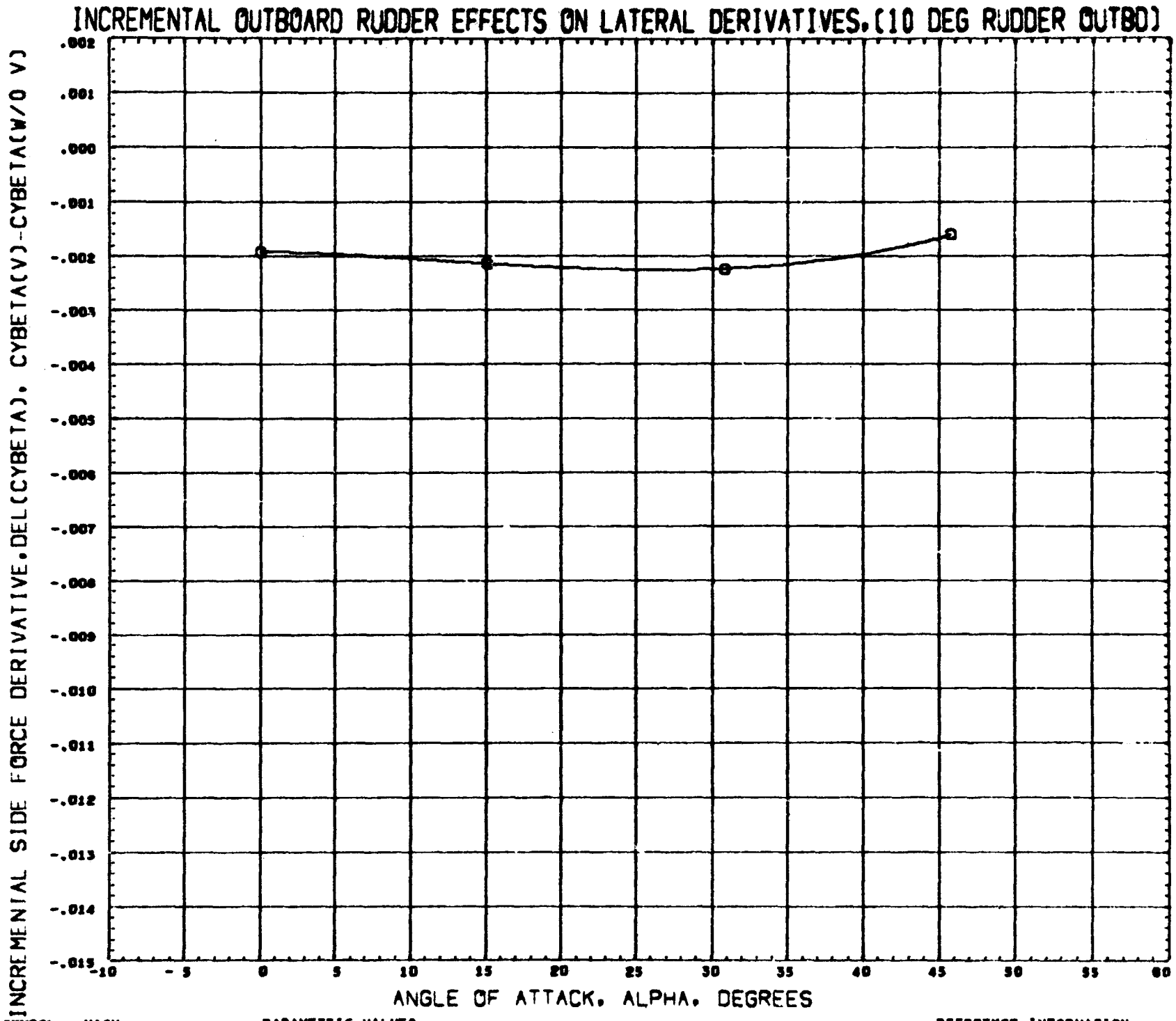
REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE


INCREMENTAL OUTBOARD RUDDER EFFECTS ON LATERAL DERIVATIVES, (0 DEG RUDDER OUTBD)
INCREMENTAL SIDE FORCE DERIVATIVE, DEL(CYBETA), CYBETA(V)-CYBETA(W/O V)
.002
.001
.000
-.001
-.002
-.003
-.004
-.005
-.006
-.007
-.008
-.009
-.010
-.011
-.012
-.013
-.014
-.015
-10
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
ANGLE OF ATTACK, ALPHA, DEGREES
SYMBOL MACH
O 5.000
PARAMETRIC VALUES
ELVATR 0.000 AILRON 0.000
RUDDER 0.000 VRTICL 0.000
REFERENCE INFORMATION
REFS 10.7320 SQ INC
REFL 2.8740 INCHES
REFB 4.9800 INCHES
XMRP 4.9790 INCHES
YMRP 0.0000 INCHES
ZMRP 0.4550 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA 70 446


INCREMENTAL OUTBOARD RUDDER EFFECTS ON LATERAL DERIVATIVES. (0 DEG RUDDER OUTBD)
INCREMENTAL DIRECTIONAL STAB. DER.. DEL(CLNDB). DCLNDB(V)-DCLNBB(W/O V)
.016
.014
.012
.010
.008
.006
.004
.002
.000
-.002
-.004
-.006
-.008
-.010
-.012
-.014
-.016
-10
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
ANGLE OF ATTACK. ALPHA. DEGREES
SYMBOL MACH PARAMETRIC VALUES
O 5.000 ELVATR 0.000 AILRON 0.000
RUDDER 0.000 VRTICL 0.000
REFERENCE INFORMATION
REFS 10.7320 SQ INC
REFL 2.0740 INCHES
REFB 4.9800 INCHES
XMRP 4.9790 INCHES
YMRP 0.0000 INCHES
ZMRP 0.4550 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA 70 446


INCREMENTAL OUTBOARD RUDDER EFFECTS ON LATERAL DERIVATIVES. (0 DEG RUDDER OUTBD)
INCREMENTAL EFFECTIVE DIHEDRAL, DEL(DCSLOB), DCSLOB(V)-DCSLOB(W/O V)
.002
.001
.000
-.001
-.002
-.003
-.004
-.005
-.006
-.007
-.008
-.009
-.010
-.011
-.012
-.013
-.014
-.015
-10
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
ANGLE OF ATTACK, ALPHA, DEGREES
SYMBOL MACH PARAMETRIC VALUES
O 5.000 ELVATR 0.000 AILRON 0.000
RUDDER 0.000 VRTICL 0.000
REFERENCE INFORMATION
REFS 10.7320 SQ INC
REFL 2.0740 INCHES
REFB 4.9800 INCHES
XMRP 4.9790 INCHES
YMRP 0.0000 INCHES
ZMRP 0.4550 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA 70 446

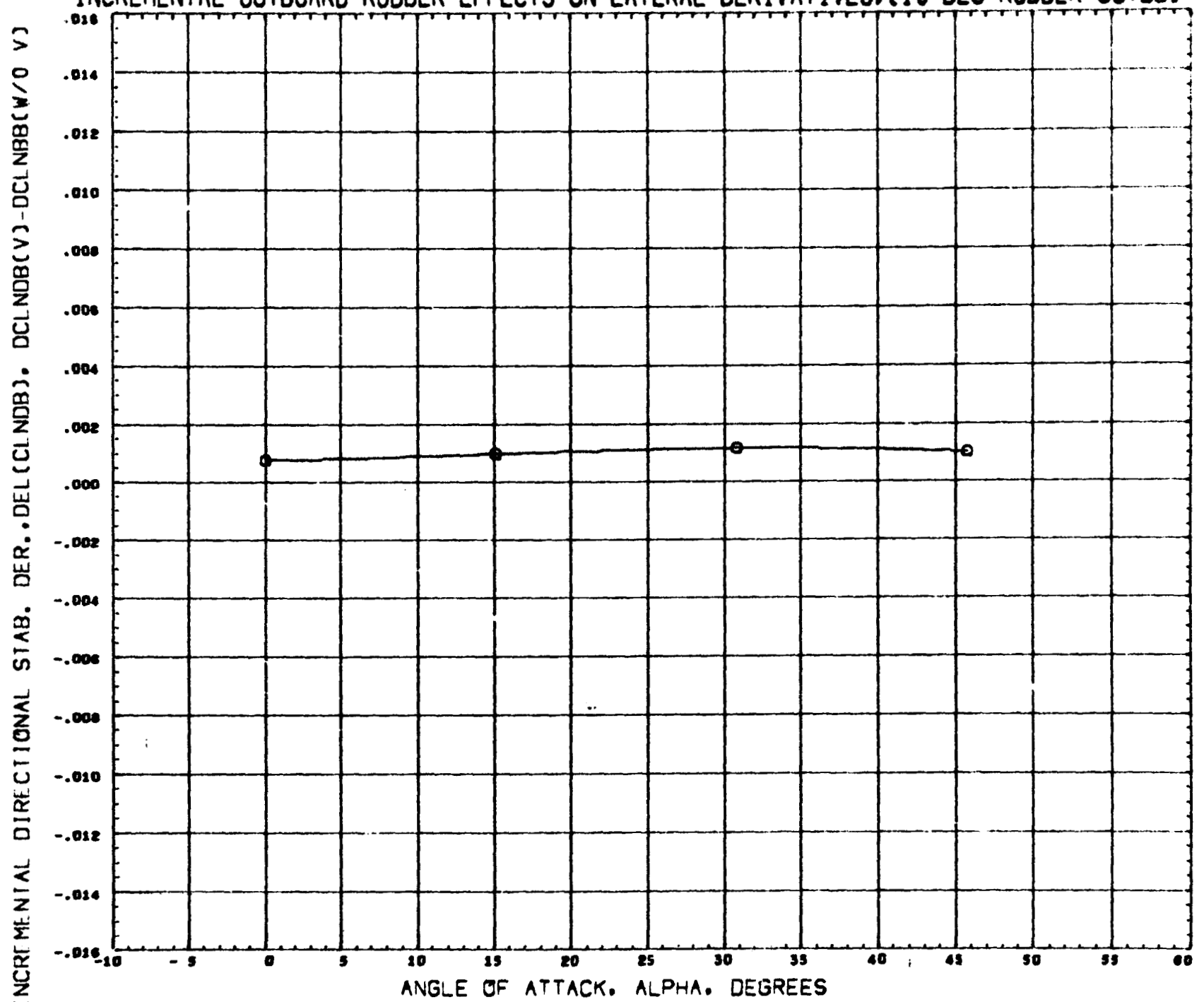


SYMBOL	MACH		PARAMETRIC VALUES		
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	10.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

INCREMENTAL OUTBOARD RUDDER EFFECTS ON LATERAL DERIVATIVES.(10 DEG RUDDER OUTBD)

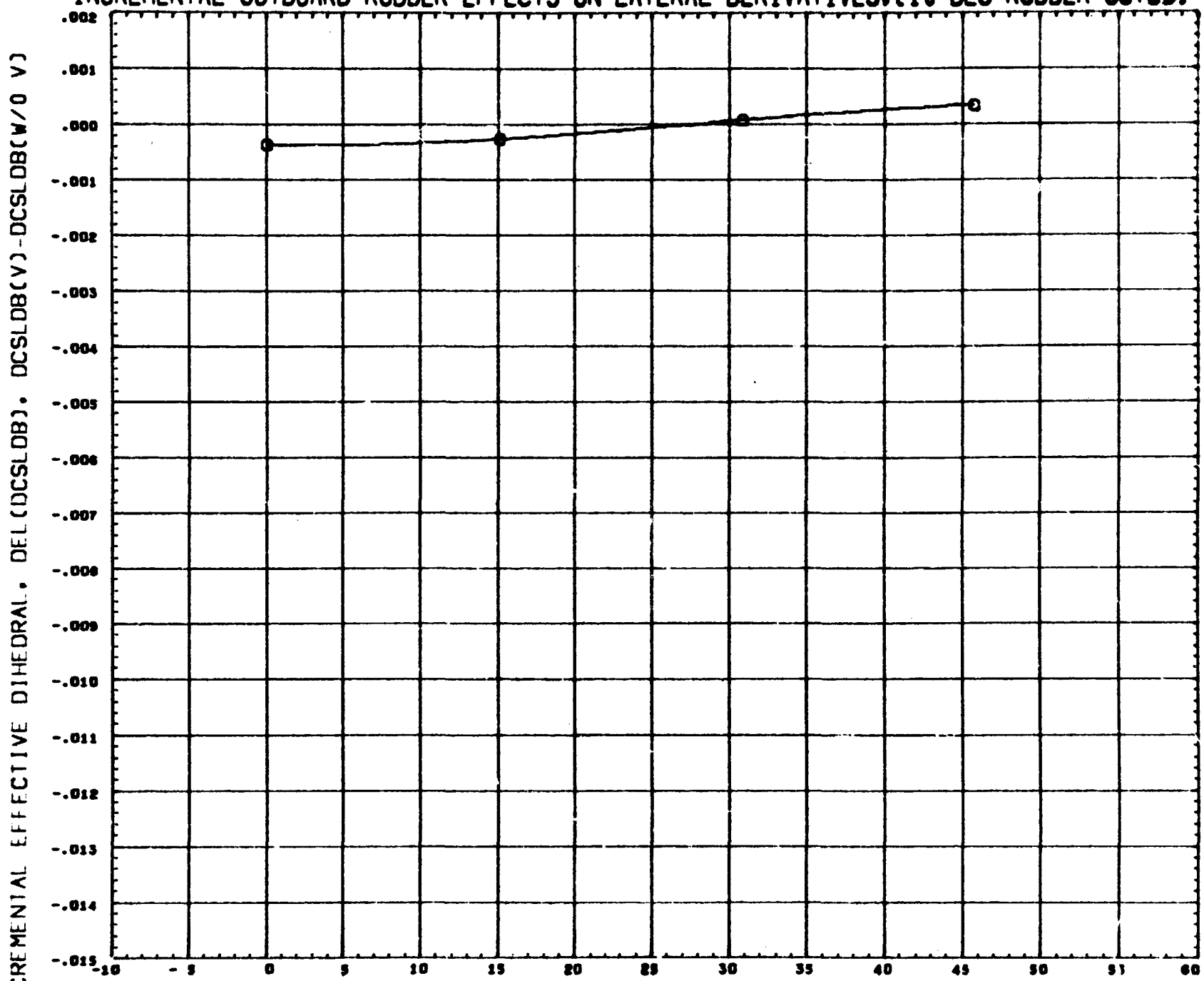


SYMBOL	MACH		PARAMETRIC VALUES		
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	10.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	7.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

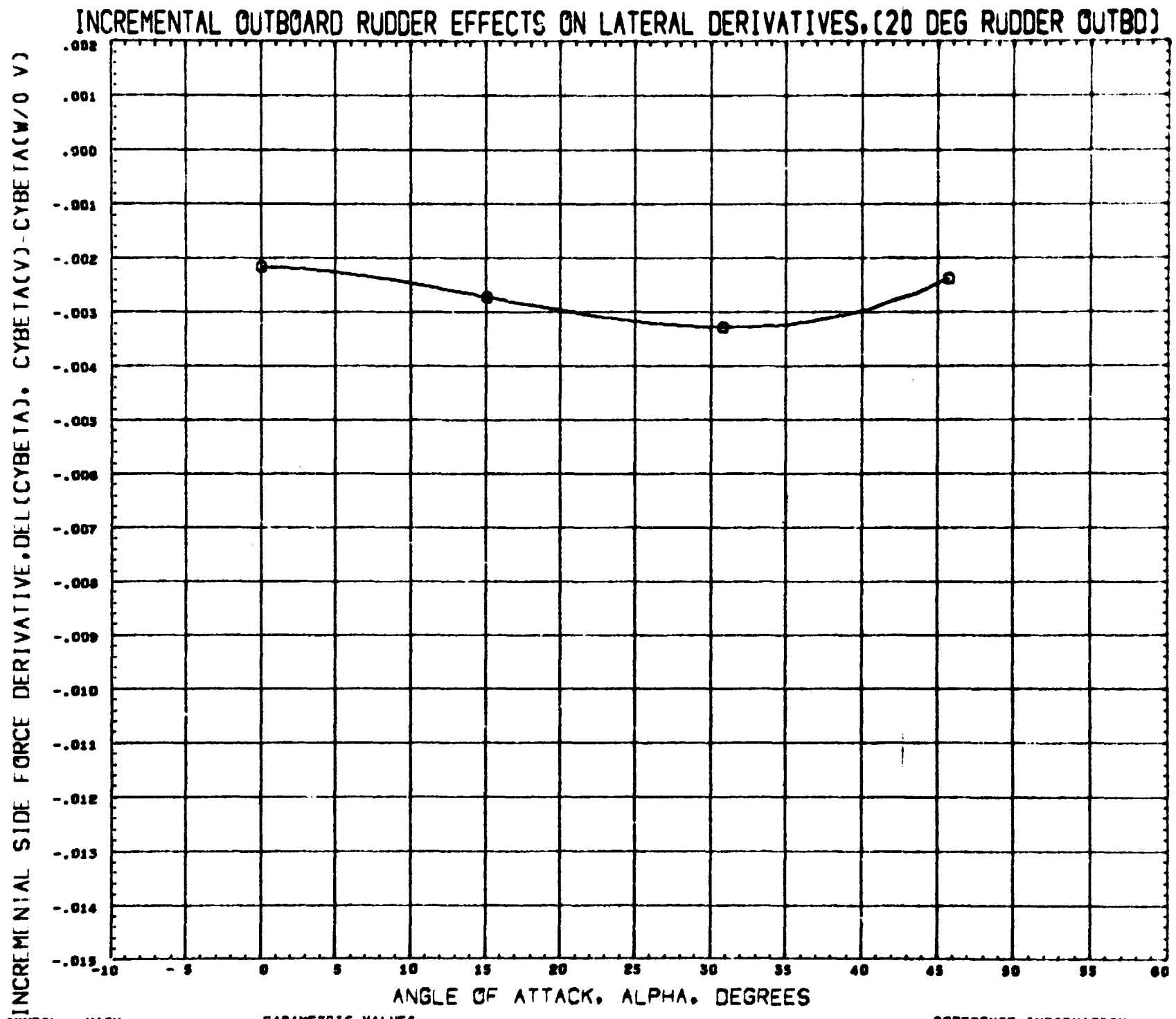
INCREMENTAL OUTBOARD RUDDER EFFECTS ON LATERAL DERIVATIVES. (10 DEG RUDDER OUTBD)

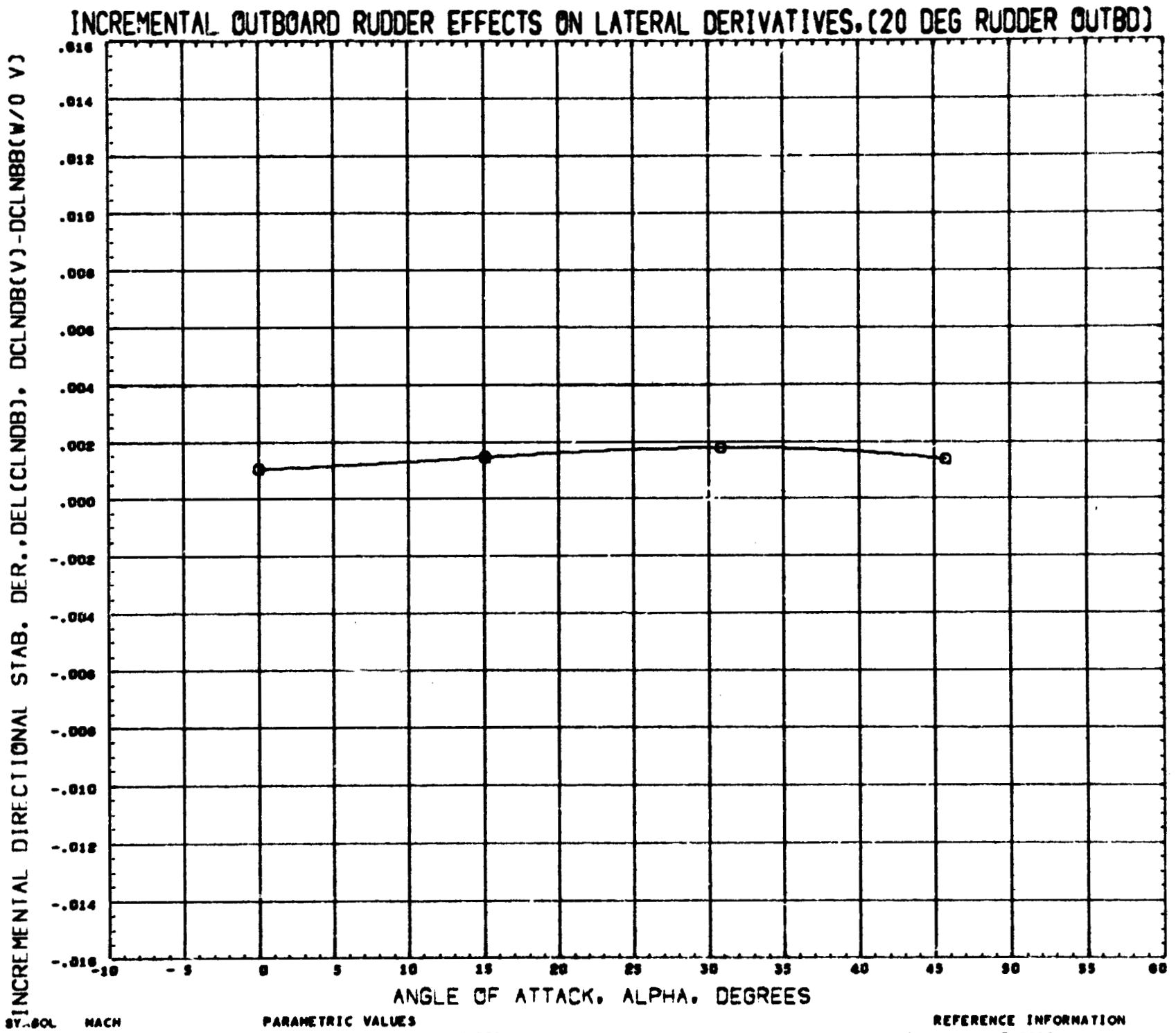


SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	10.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

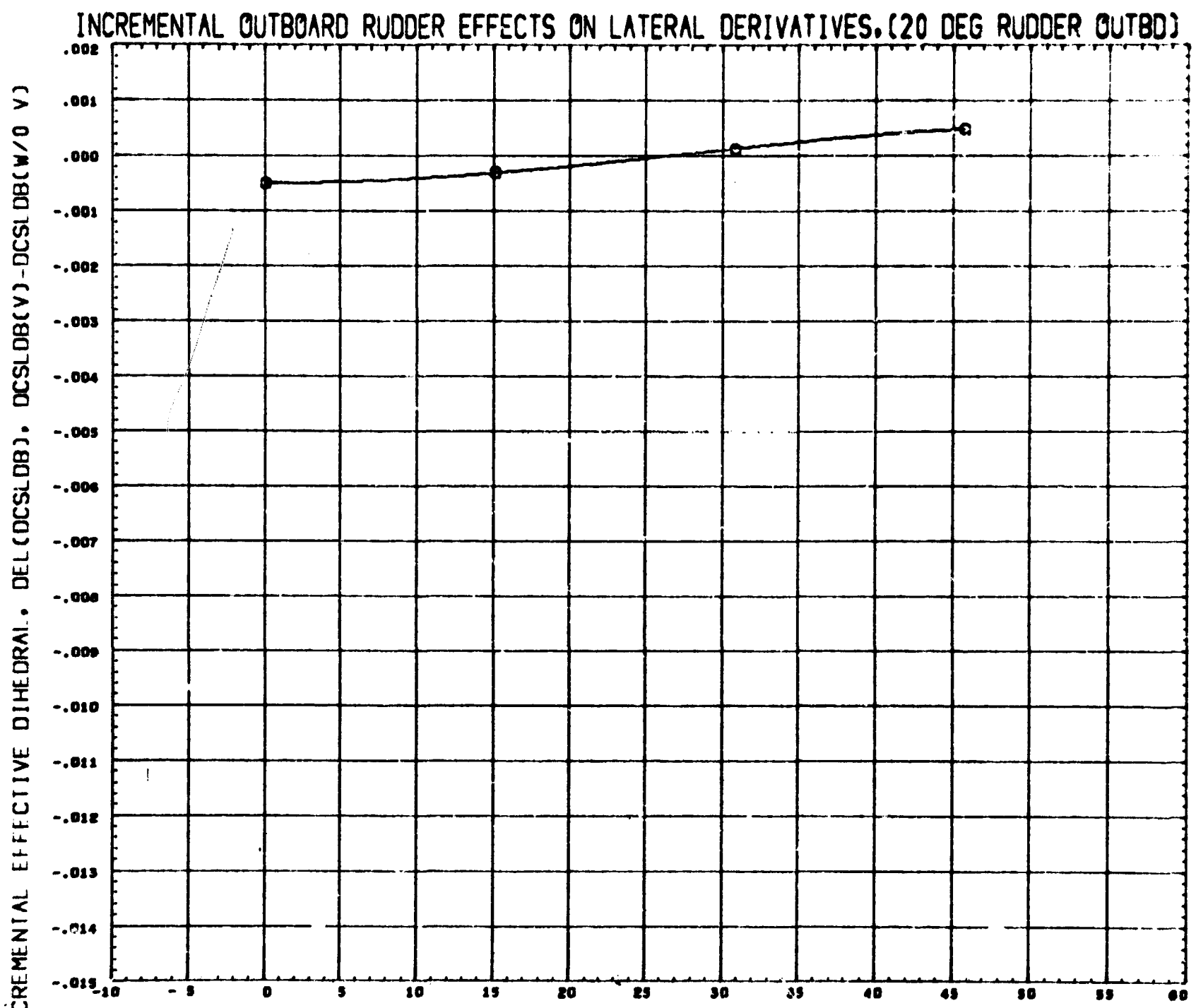

INCREMENTAL OUTBOARD RUDDER EFFECTS ON LATERAL DERIVATIVES.(20 DEG RUDDER OUTBD)
INCREMENTAL SIDE FORCE DERIVATIVE.DEL(CYBETA). CYBETA(V)-CYBETA(W/O V)
.002
.001
.000
-.001
-.002
-.003
-.004
-.005
-.006
-.007
-.008
-.009
-.010
-.011
-.012
-.013
-.014
-.015
-10
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
ANGLE OF ATTACK, ALPHA, DEGREES
SYMBOL MACH
O 5.000
PARAMETRIC VALUES
ELVATR 0.000
AILRON 0.000
RUDDER 0.000
VRTICL 20.000
REFERENCE INFORMATION
REFS 10.7320 SQ INC
REFL 2.8740 INCHES
REFB 4.9800 INCHES
XMRP 4.9790 INCHES
YMRP 0.0000 INCHES
ZMRP 0.4550 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA TO 446



SYMBOL	MACH		PARAMETRIC VALUES		
O	8.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	20.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE


INCREMENTAL OUTBOARD RUDDER EFFECTS ON LATERAL DERIVATIVES. (20 DEG RUDDER OUTBD)
INCREMENTAL EFFECTIVE DIHEDRAL. DEL(DCSLDB). DCSLDB(V)-DCSLDB(W/O V)
.002
.001
.000
-.001
-.002
-.003
-.004
-.005
-.006
-.007
-.008
-.009
-.010
-.011
-.012
-.013
-.014
-.015
-10
-5
0
5
10
15
20
25
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35
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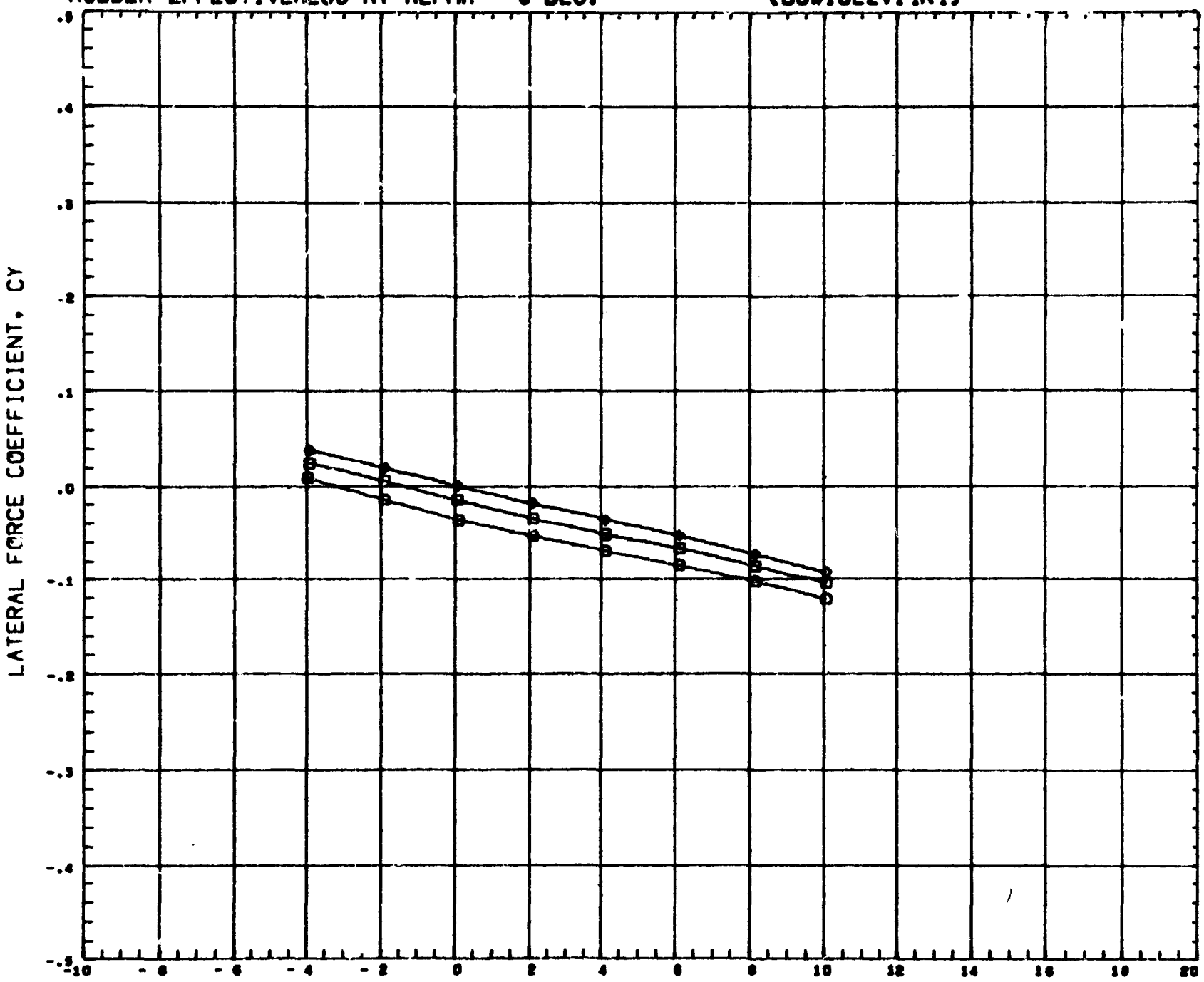
45
50
55
60
ANGLE OF ATTACK. ALPHA. DEGREES
SYMBOL MACH PARAMETRIC VALUES
O 5.000 ELVATR 0.000 AILRON 0.000
RUDDER 0.000 VRTICL 20.000
REFERENCE INFORMATION
REFS 10.7320 SQ INC
REFL 2.8740 INCHES
REFB 4.9800 INCHES
XMRP 4.9790 INCHES
YMRP 0.0000 INCHES
ZMRP 0.4550 INCHES
SCALE 0.0035 SCALE
REFERENCE FILE NA 70 446

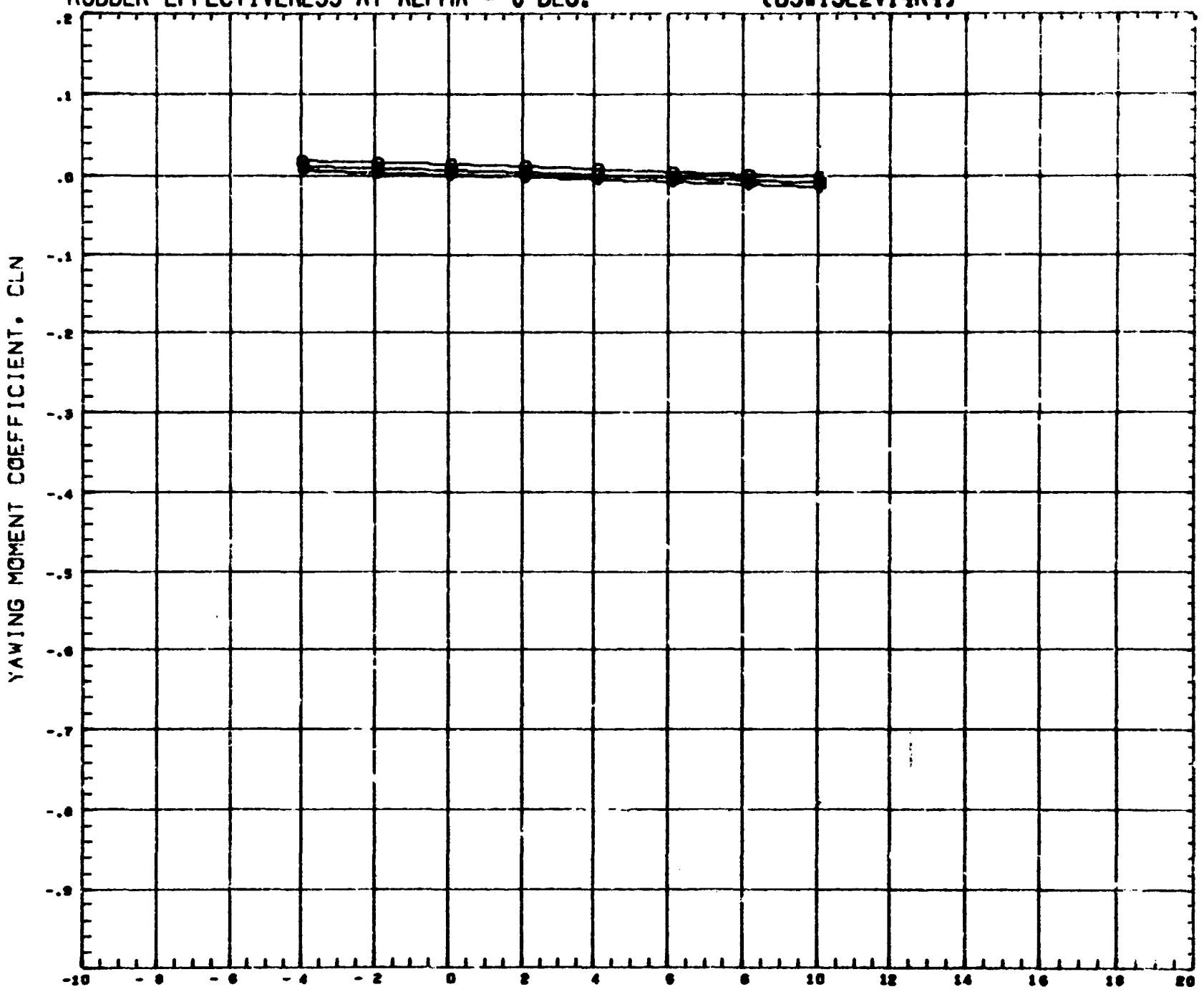
RUDDER EFFECTIVENESS AT ALPHA = 0 DEG. (B5W13E2V14R4)



SYMBOL	RUDDER		PARAMETRIC VALUES			REFERENCE INFORMATION		
□	- 20.000	MACH	4.960	ALPHA	- 0.020	REFS	10.7320	SQ INCHES
□	- 10.000	ELVATR	0.000	AILRON	0.000	REFL	2.8740	INCHES
◇	0.000	VRTICL	0.000			REFB	4.9800	INCHES
						XMRP	4.9790	INCHES
						YMRP	0.0000	INCHES
						ZMRP	0.4550	INCHES
						SCALE	0.0035	SCALE

REFERENCE FILE NA 70 346

RUDDER EFFECTIVENESS AT ALPHA = 0 DEG. (B5W13E2V14R4)

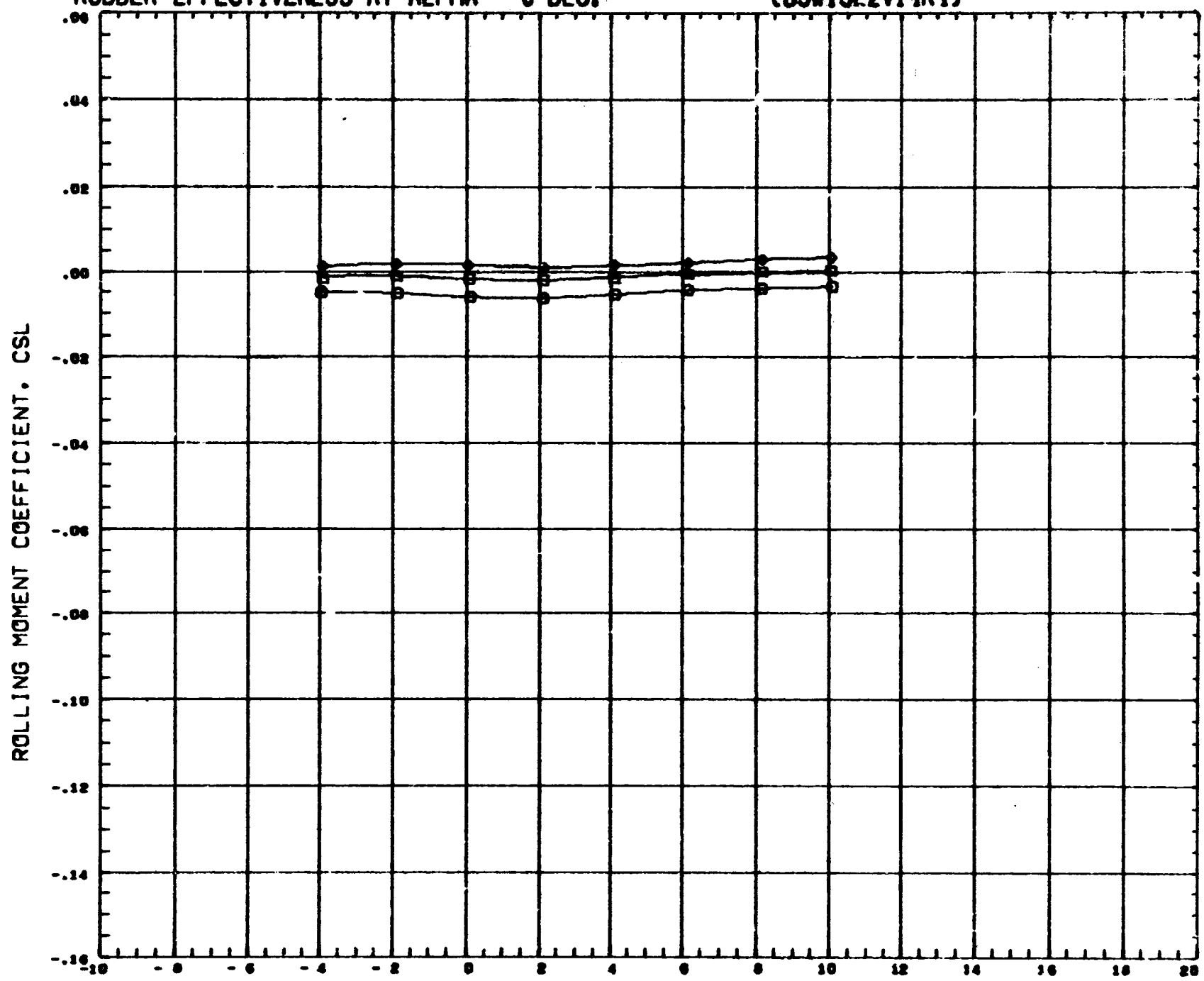


SYMBOL	RUDDER	PARAMETRIC VALUES			
○	- 20.000	MACH	4.960	ALPHA	- 0.020
□	- 10.000	ELVATR	0.000	AILRON	0.000
◇	0.000	VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4950	INCHES
SCALE	0.0035	SCALE

RUDDER EFFECTIVENESS AT ALPHA = 0 DEG. (B5W13E2V14R4)

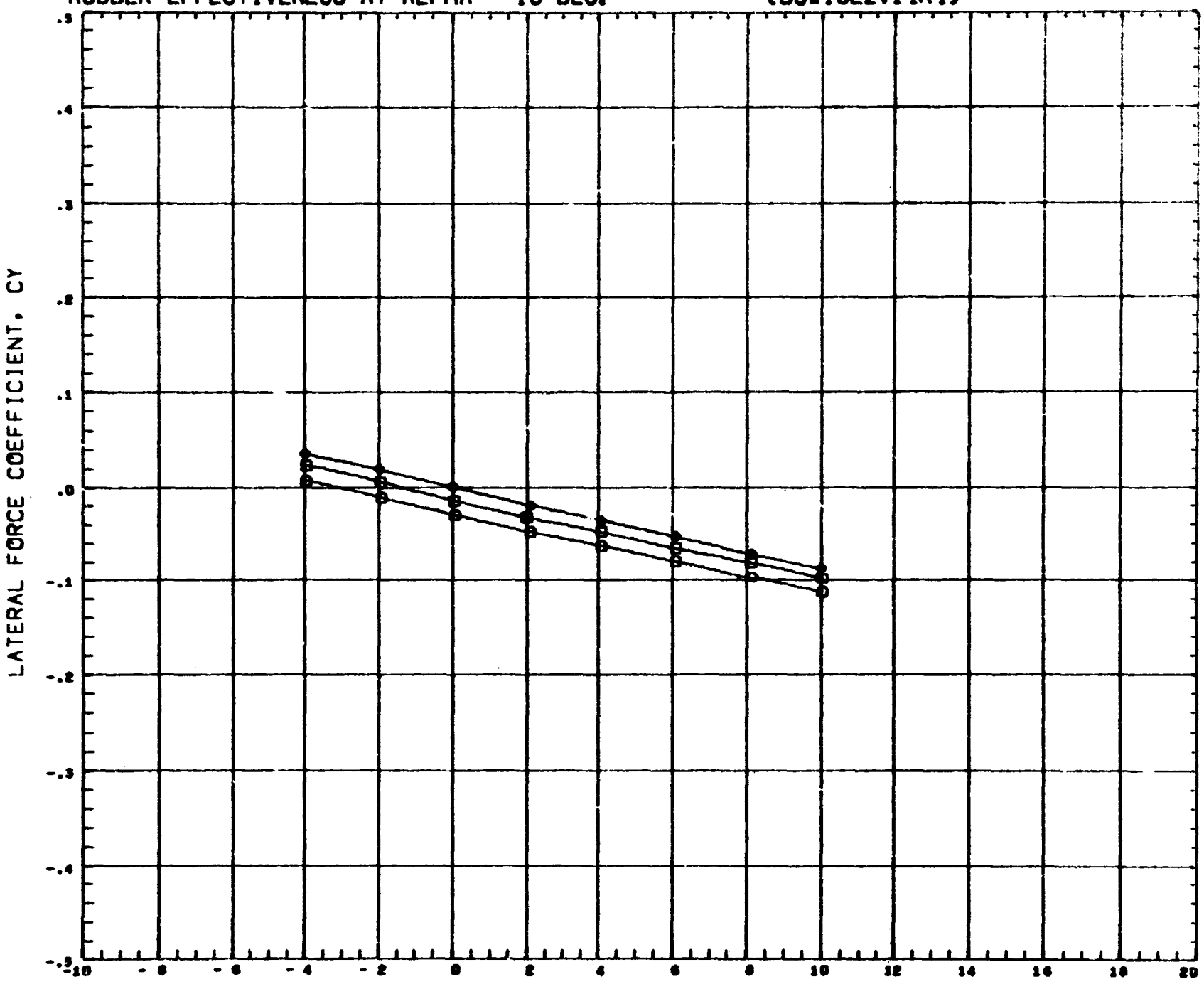


SYMBOL	RUDDER		PARAMETRIC VALUES		
○	- 20.000	MACH	4.900	ALPHA	- 0.020
□	- 10.000	ELVATR	0.000	AILRON	0.000
◇	0.000	VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	18.7320	SQ INC
REFL	8.0740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

RUDDER EFFECTIVENESS AT ALPHA = 15 DEG. (B5W13E2V14R4)

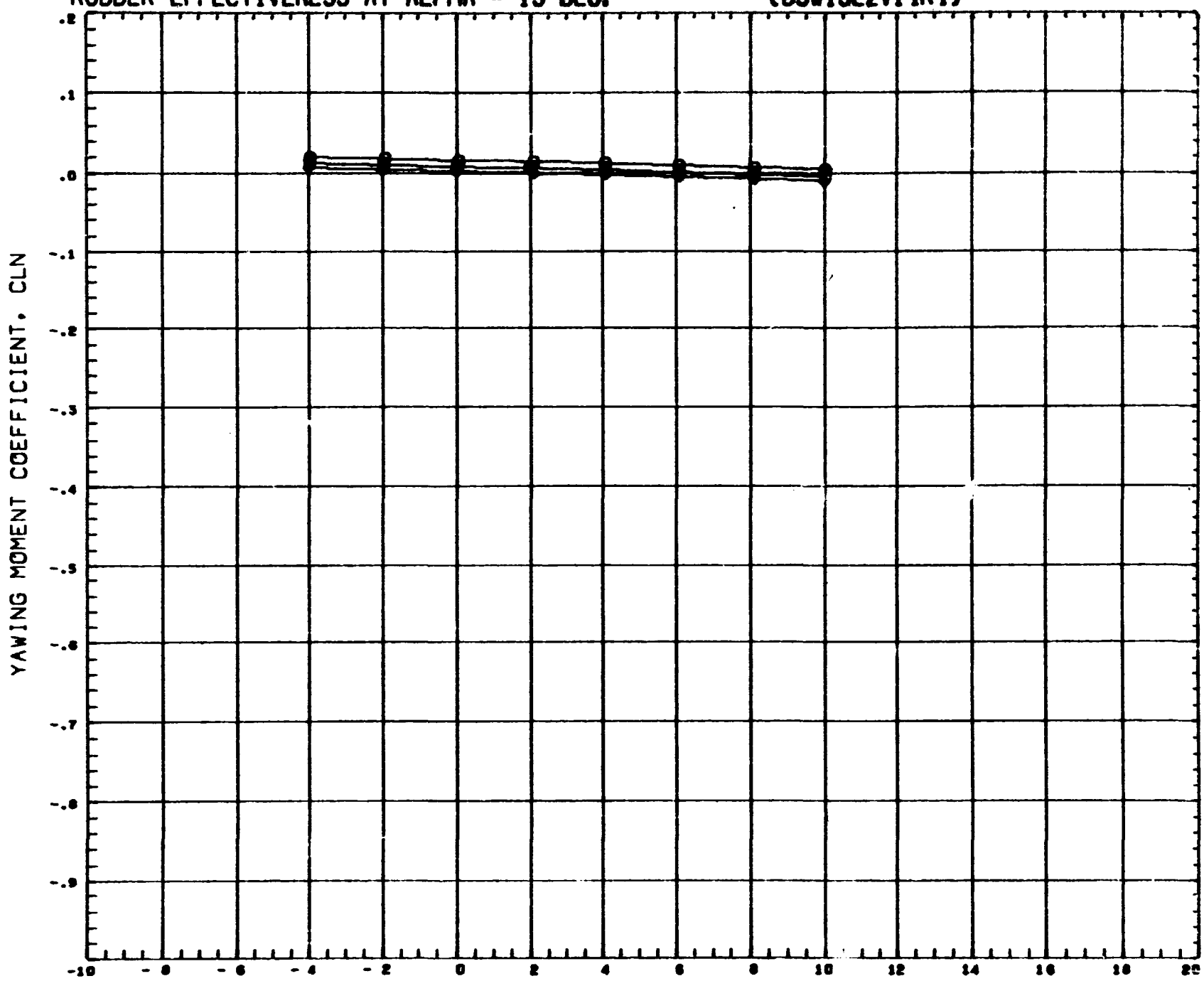


SYMBOL	RUDDER		PARAMETRIC VALUES		
○	- 20.000	MACH	4.960	ALPHA	15.130
□	- 10.000	ELVATR	0.000	AILRON	0.000
◇	0.000	VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7328	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9700	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

RUDDER EFFECTIVENESS AT ALPHA = 15 DEG. (B5W13E2V14R4)

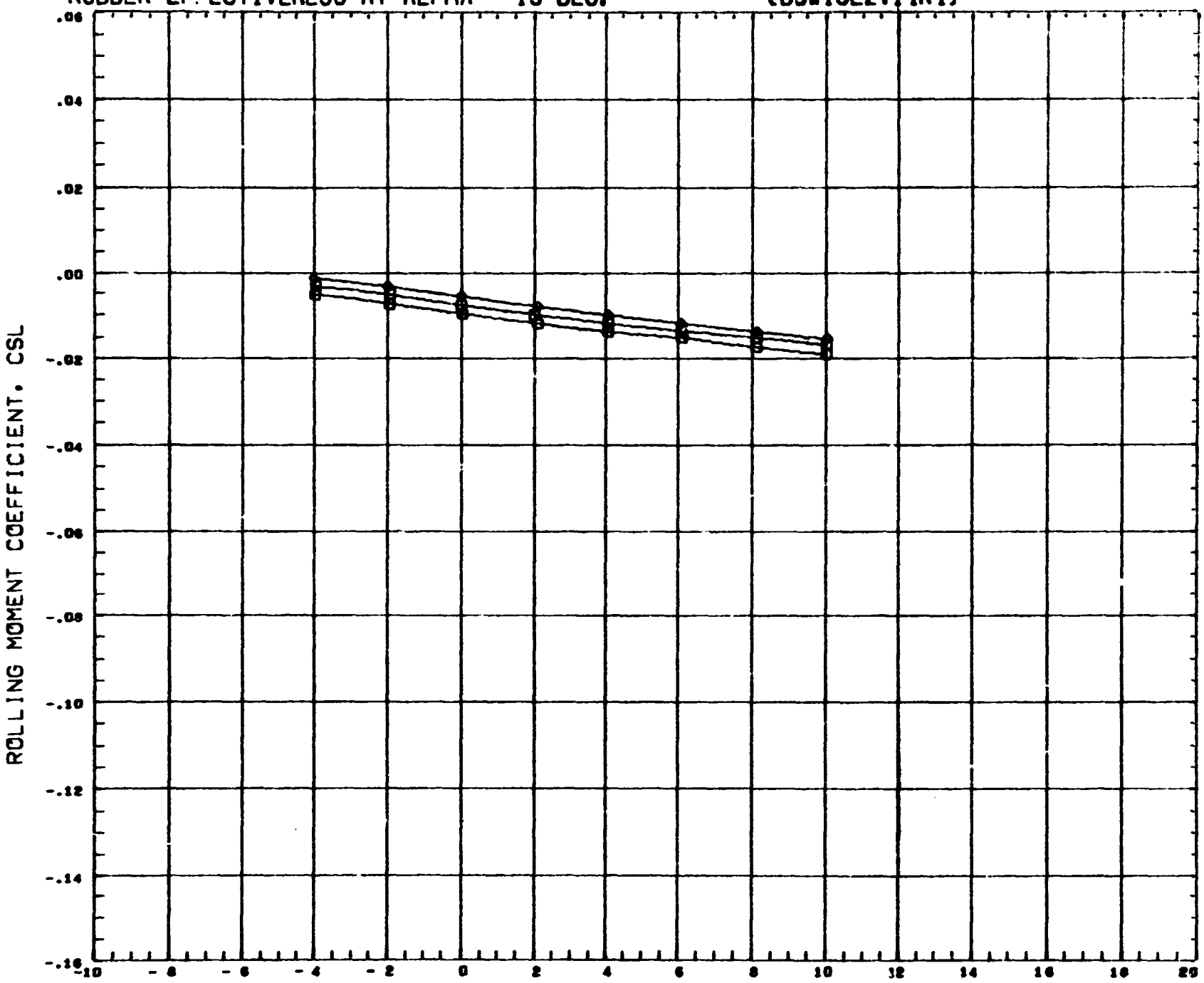


SYMBOL	RUDDER		PARAMETRIC VALUES		
○	- 20.000	MACH	4.960	ALPHA	15.130
□	- 10.000	ELVATR	0.000	AILRON	0.000
◇	0.000	VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INCHES
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

RUDDER EFFECTIVENESS AT ALPHA = 15 DEG. (B5W13E2V14R4)

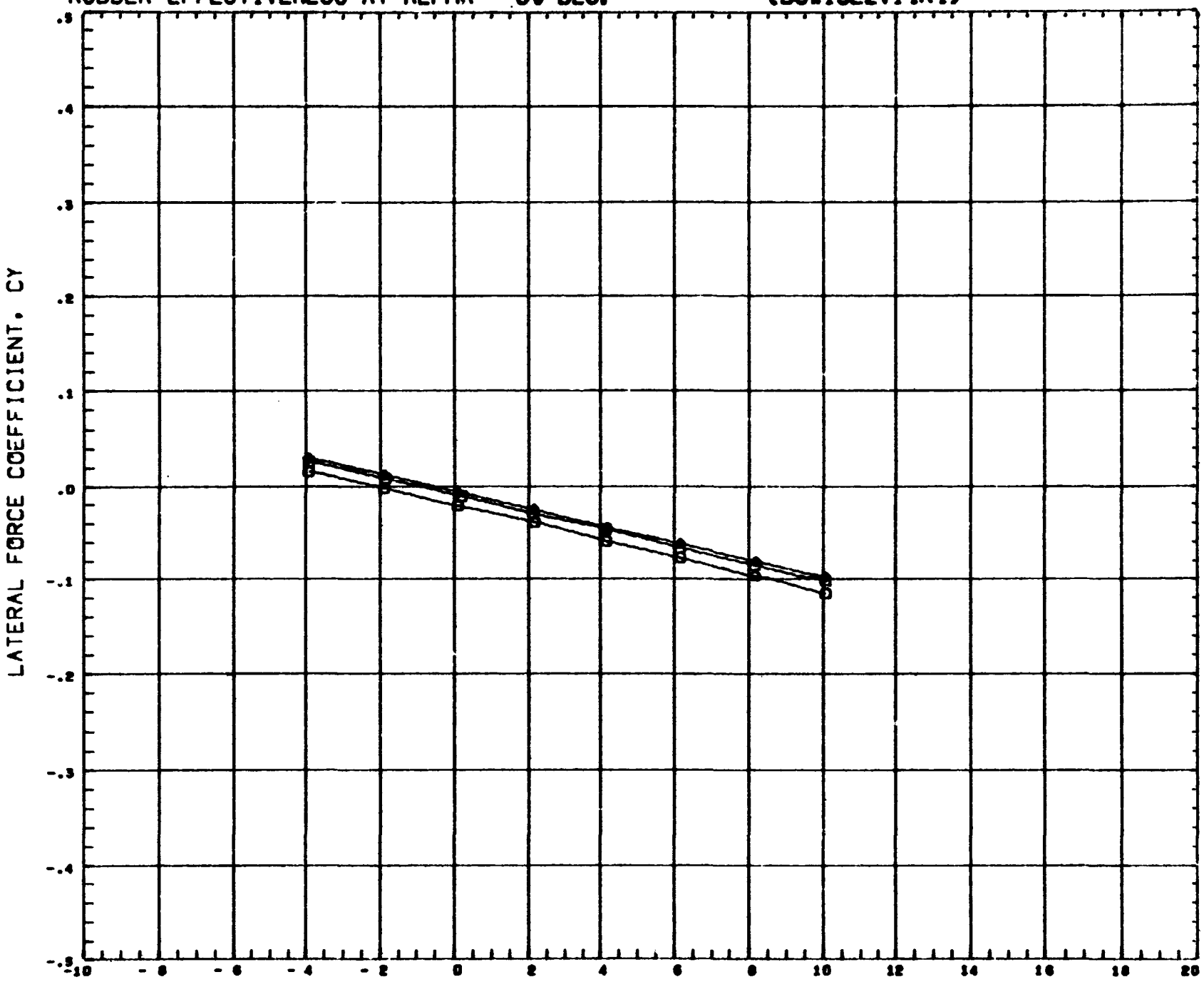


SYMBOL	RUDDER	PARAMETRIC VALUES			
○	- 20.000	MACH	4.960	ALPHA	15.130
□	- 10.000	ELVATR	0.000	AILRON	0.000
◇	0.000	VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4950	INCHES
SCALE	0.0035	SCALE

RUDDER EFFECTIVENESS AT ALPHA = 30 DEG. (B5W13E2V14R4)

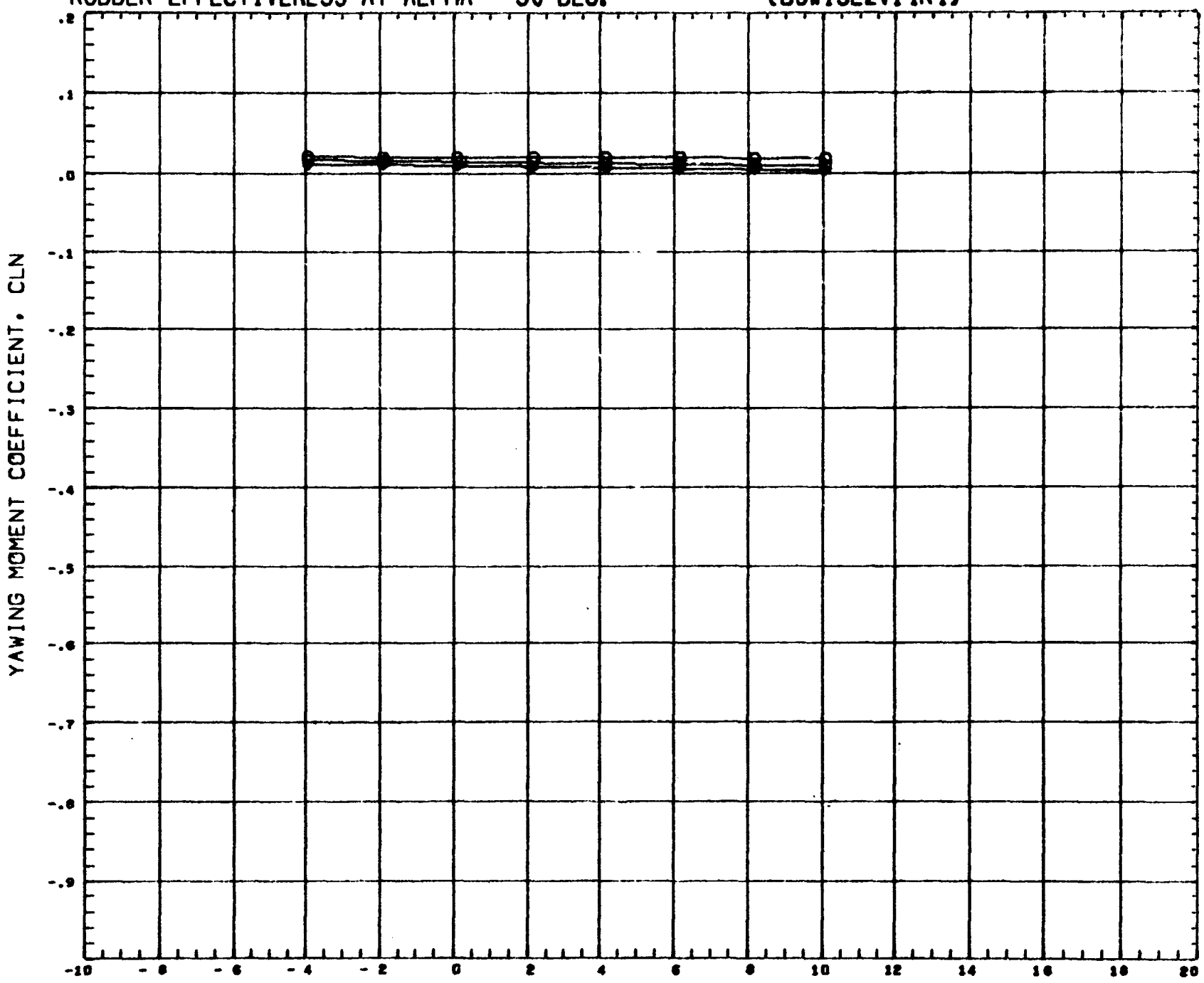


SYMBOL	RUDDER		PARAMETRIC VALUES		
○	- 20.000	MACH	4.960	ALPHA	30.020
□	- 10.000	ELVATR	0.000	AILRON	0.000
◇	0.000	VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

RUDDER EFFECTIVENESS AT ALPHA = 30 DEG. (B5W13E2V14R4)

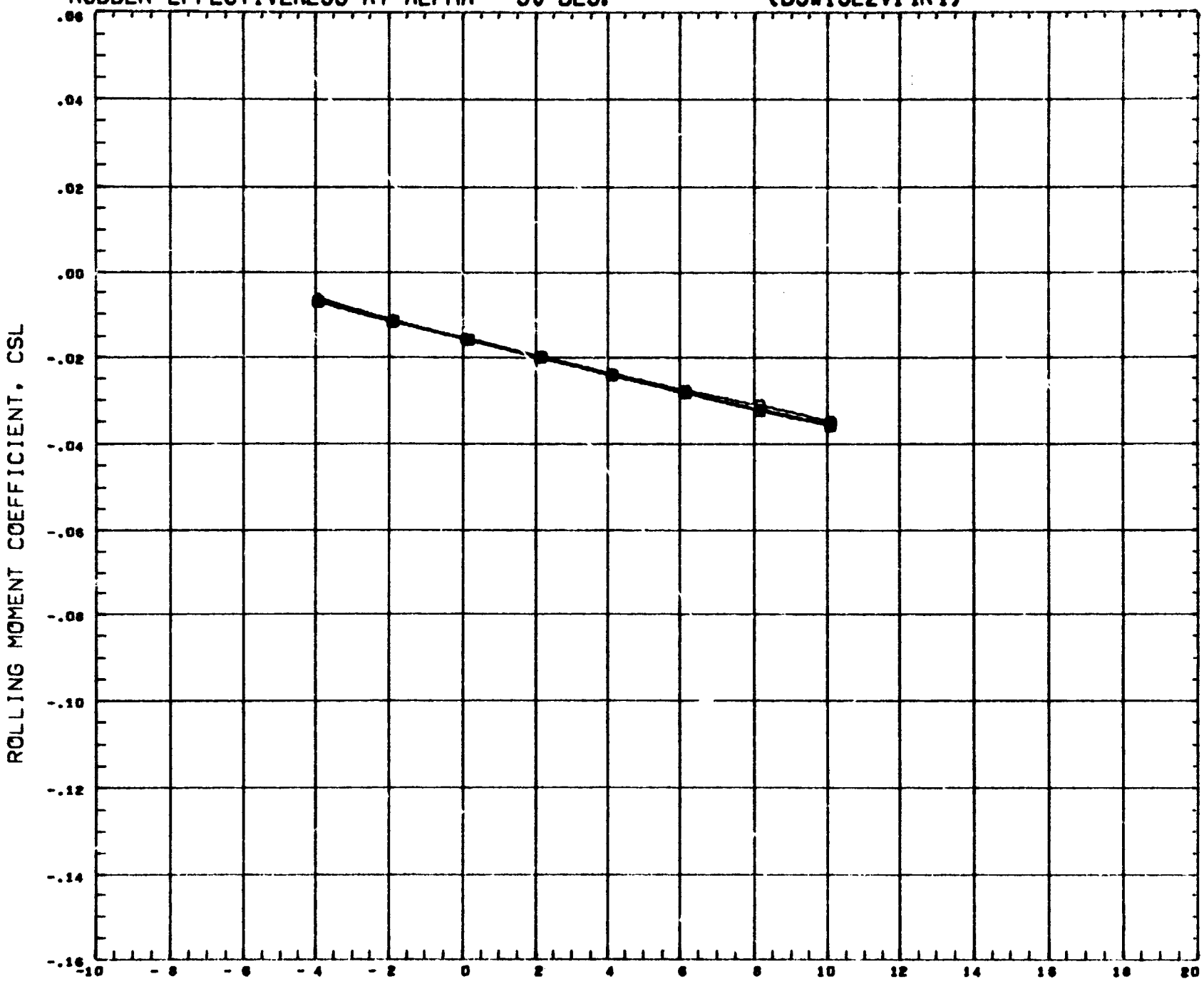


SYMBOL	RUDDER		PARAMETRIC VALUES		
○	- 20.000	MACH	4.960	ALPHA	30.820
□	- 10.000	ELVATR	0.000	AILRON	0.000
◇	0.000	VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

RUDDER EFFECTIVENESS AT ALPHA = 30 DEG. (B5W13E2V14R4)

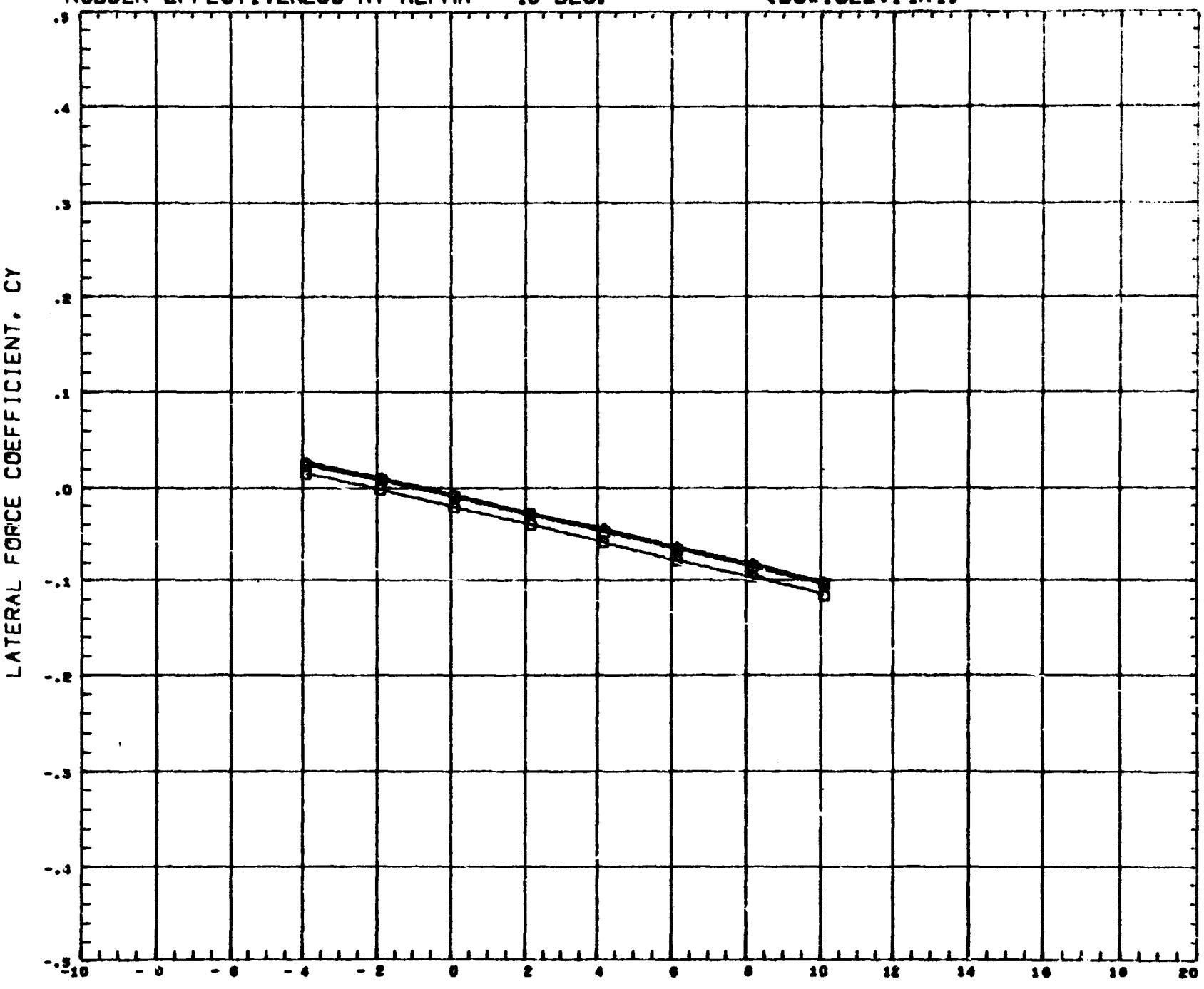


SYMBOL	RUDDER		PARAMETRIC VALUES		
○	- 20.000	MACH	4.960	ALPHA	30.000
□	- 10.000	ELVATR	0.000	AILRON	0.000
◇	0.000	VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

RUDDER EFFECTIVENESS AT ALPHA = 45 DEG. (B5W13E2V14R4)

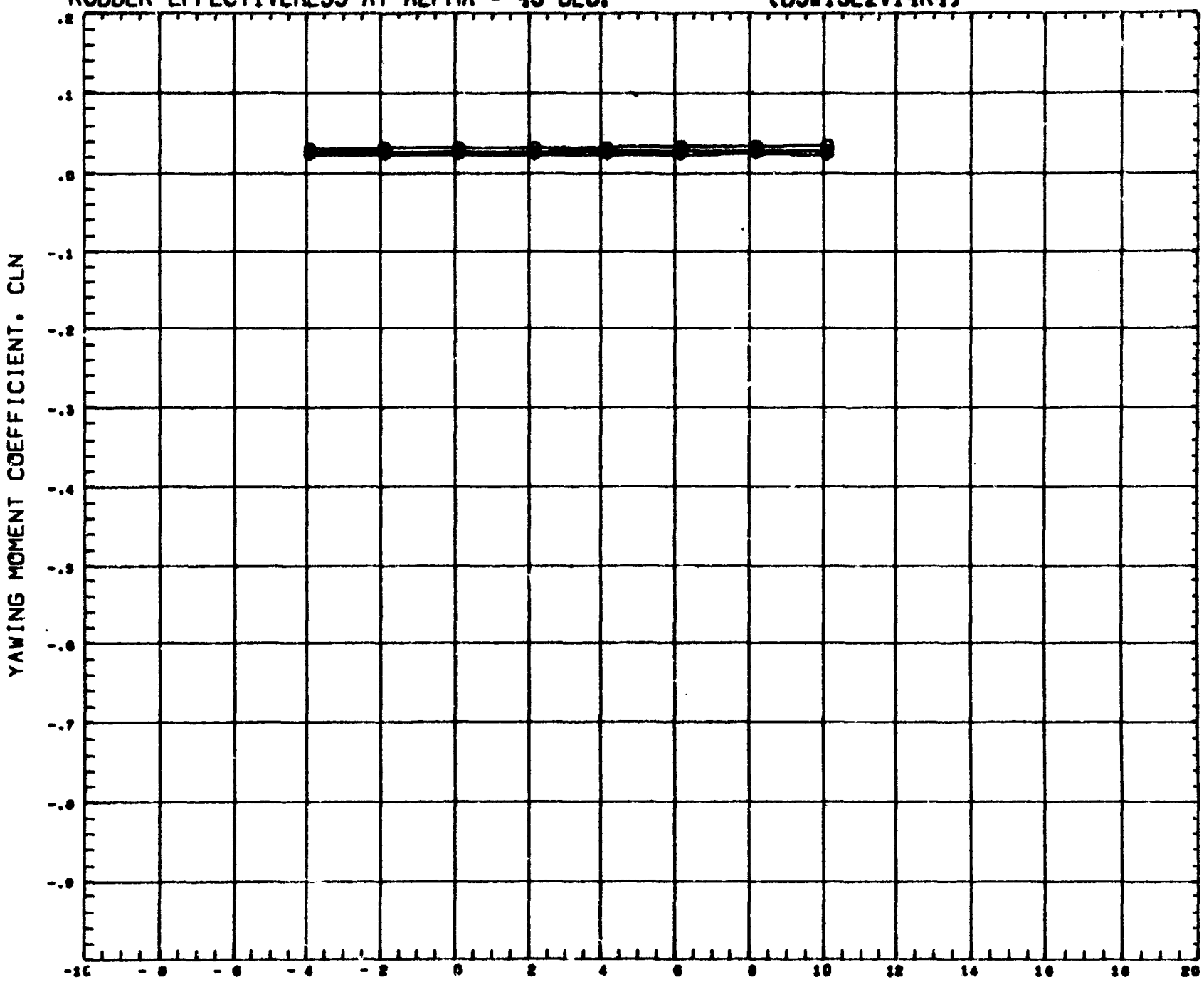


SYMBOL	RUDDER		PARAMETRIC VALUES		
○	- 20.000	MACH	4.960	ALPHA	45.790
□	- 10.000	ELVATR	0.000	AILRON	0.000
◇	0.000	VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

RUDDER EFFECTIVENESS AT ALPHA = 45 DEG. (B5W13E2V14R4)

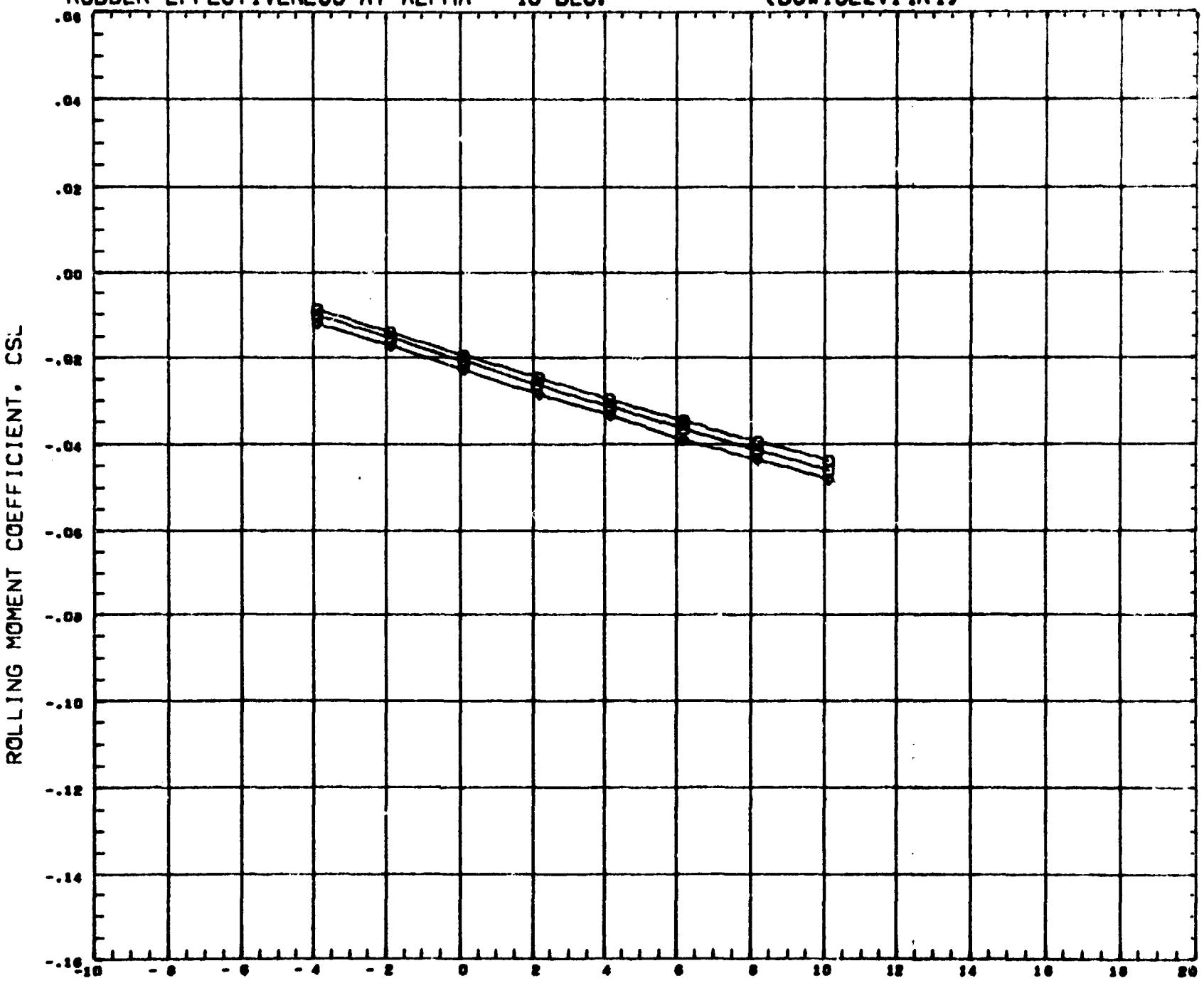


SYMBOL	RUDDER		PARAMETRIC VALUES		
□	- 20.000	MACH	4.960	ALPHA	45.790
□	- 10.000	ELVATR	0.000	AILRON	0.000
◇	0.000	VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	80 INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0039	SCALE

RUDDER EFFECTIVENESS AT ALPHA = 45 DEG. (B5W13E2V14R4)

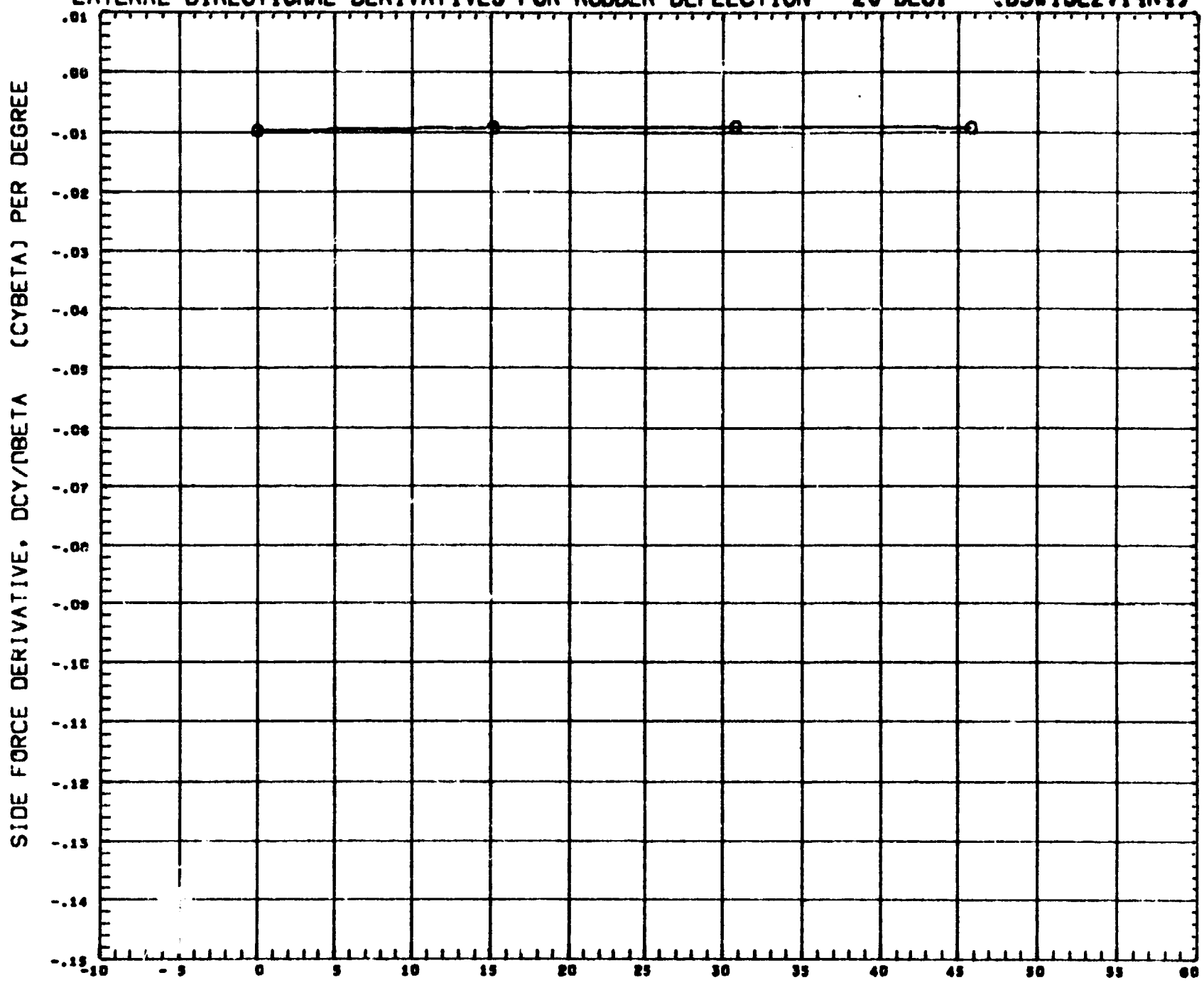


SYMBOL	RUDDER		PARAMETRIC VALUES		
○	- 20.000	MACH	4.960	ALPHA	45.790
□	- 10.000	ELVATR	0.000	AILRON	0.000
◇	0.000	VRTICL	0.000		

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	80 INC
REFL	2.8740	INCHES
REFB	4.9000	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

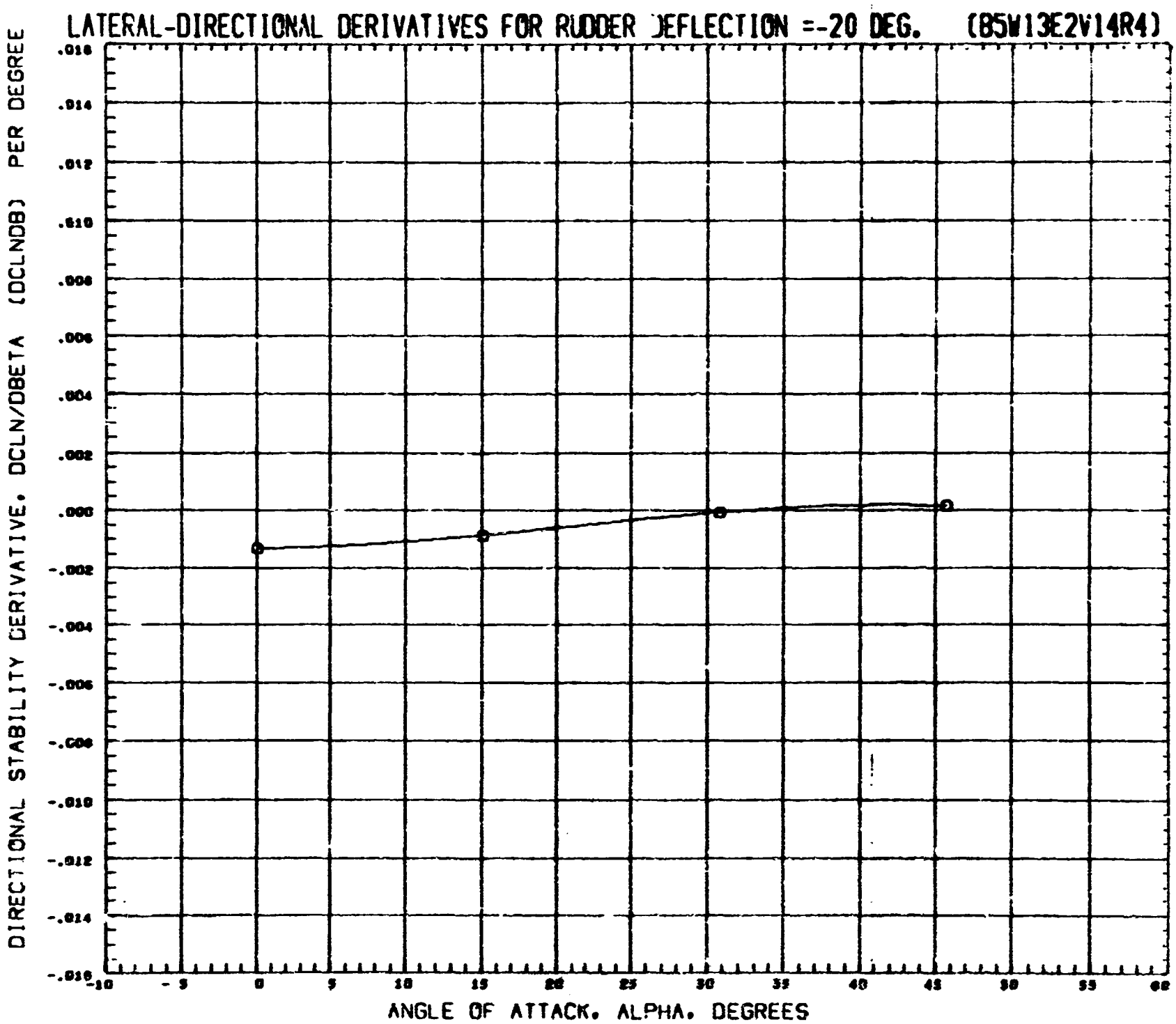
LATERAL-DIRECTIONAL DERIVATIVES FOR RUDDER DEFLECTION =-20 DEG. (B5W13E2V14R4)



SYMBOL	MACH	PARAMETRIC VALUES			
O	9.000	ELVATR	0.000	AILRON	0.000
		RUDDER	- 20.000	VRTICL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4350	INCHES
SCALE	0.0035	SCALE

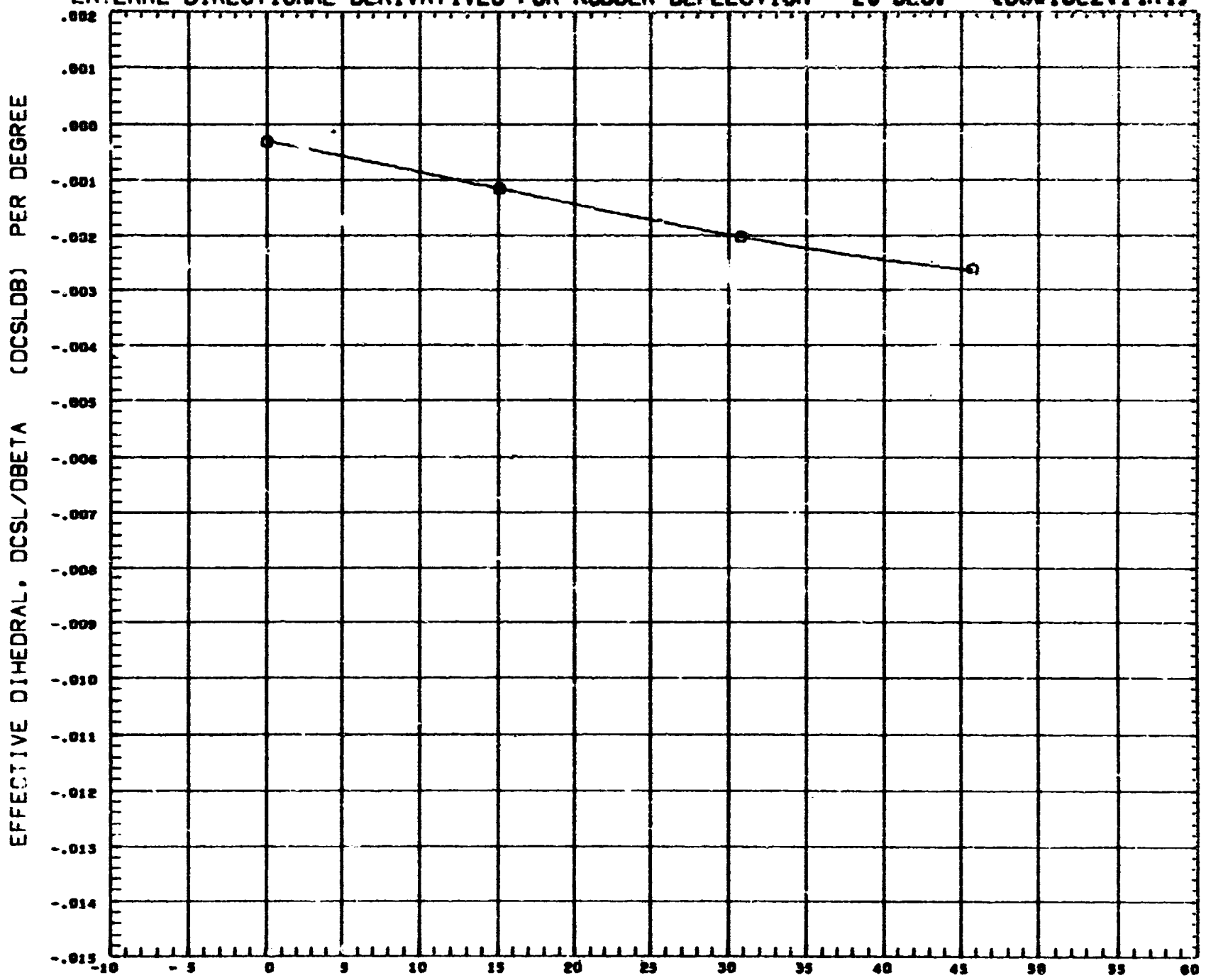


SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	A LRON	0.000
		RUDDER	- 20.000	VRTICL	0.000

REFERENCE FILE HA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8760	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4950	INCHES
SCALE	0.0035	SCALE

LATERAL-DIRECTIONAL DERIVATIVES FOR RUDDER DEFLECTION =-20 DEG. (B5W13E2V14R4)

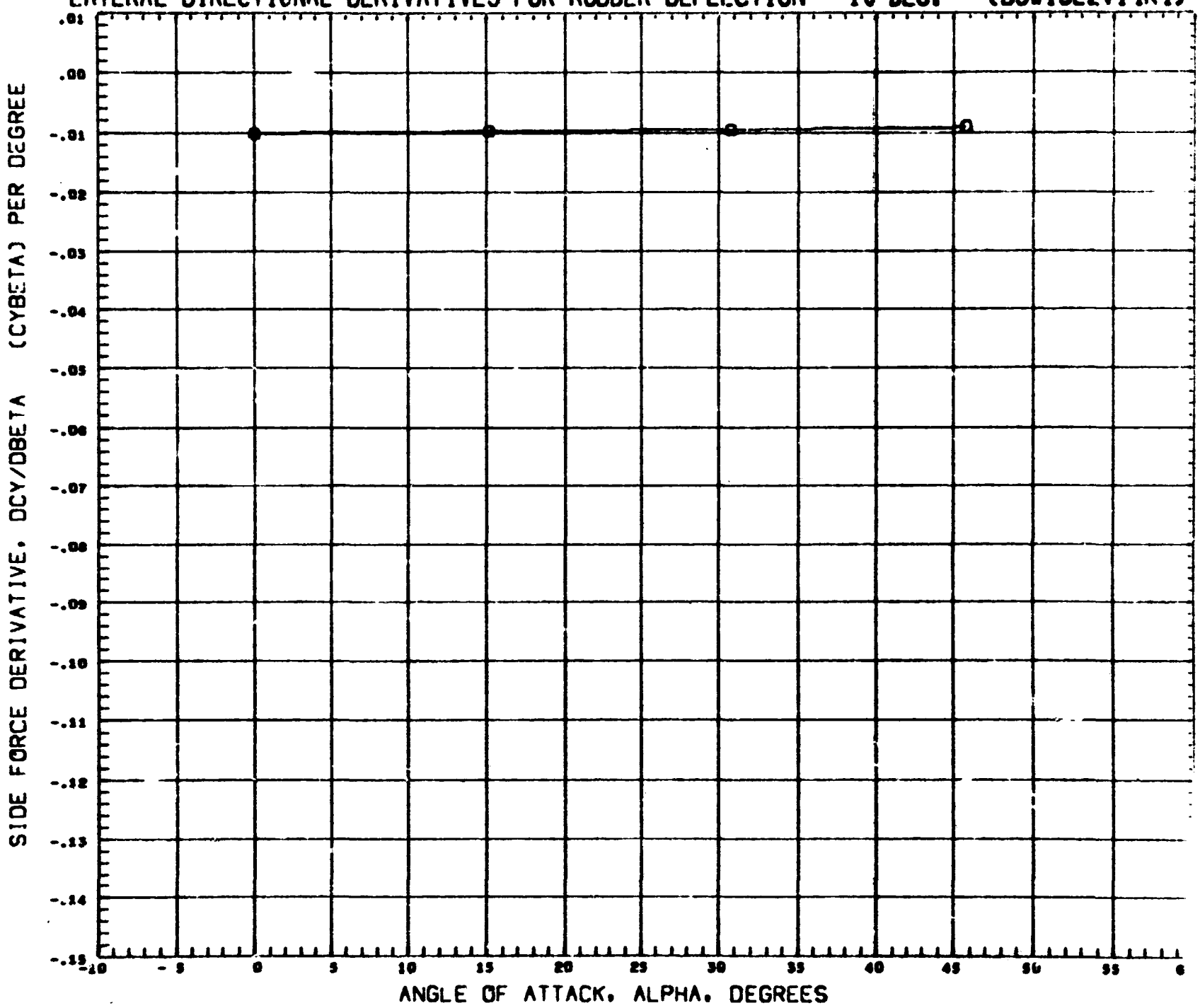


SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	-20.000	VRTICL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.6740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

LATERAL-DIRECTIONAL DERIVATIVES FOR RUDDER DEFLECTION =-10 DEG. (B5W13E2V14R4)

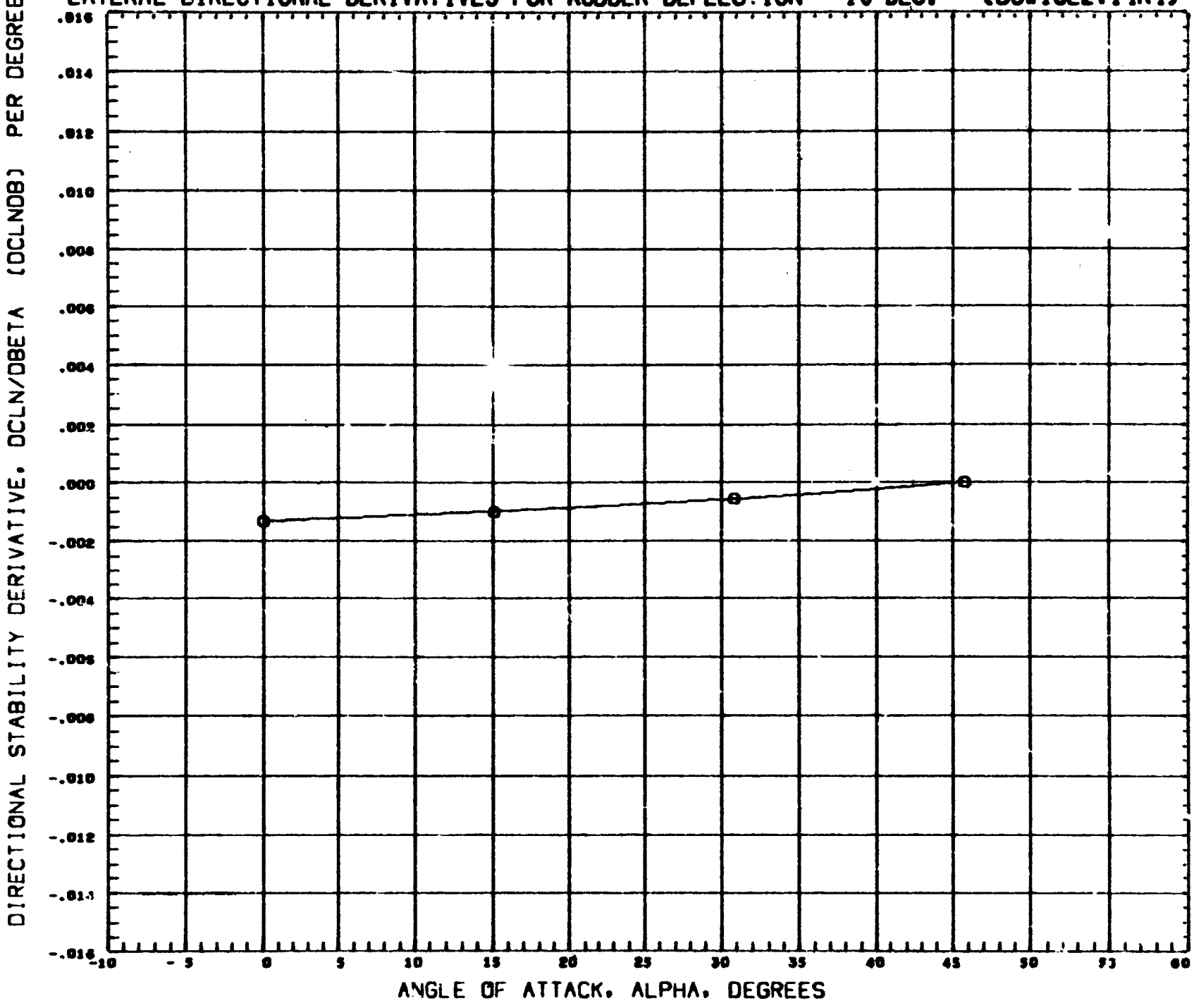


SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVAIR	0.000	AILRON	0.000
		RUDDER	- 10.000	VRTICL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4590	INCHES
SCALE	0.0035	SCALE

LATERAL-DIRECTIONAL DERIVATIVES FOR RUDDER DEFLECTION =-10 DEG. (B5W13E2V14R4)

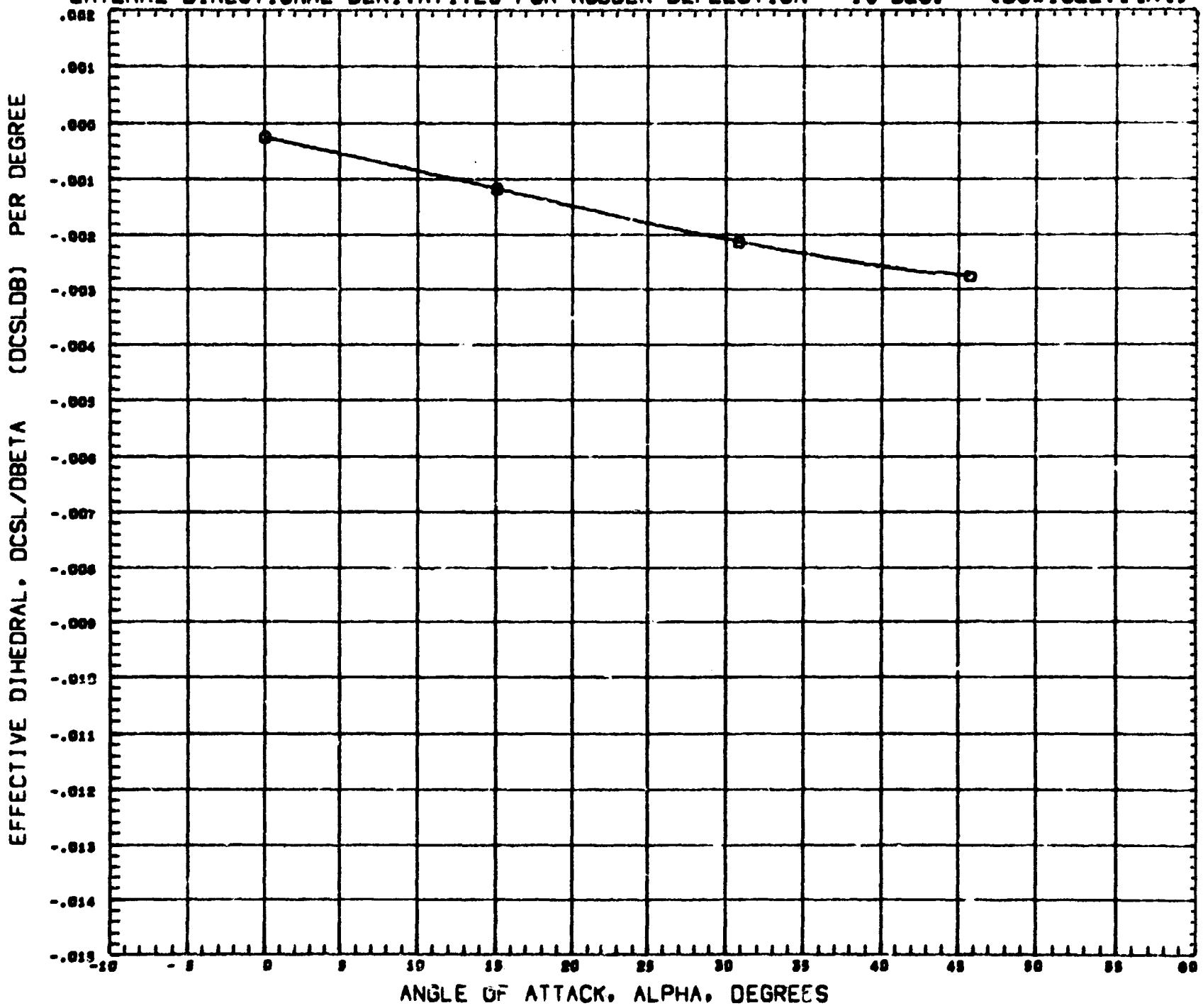


SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	- 10.000	VRTICL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4559	INCHES
SCALE	0.0035	SCALE

LATERAL-DIRECTIONAL DERIVATIVES FOR RUDDER DEFLECTION =-10 DEG. (B5W13E2V14R4)

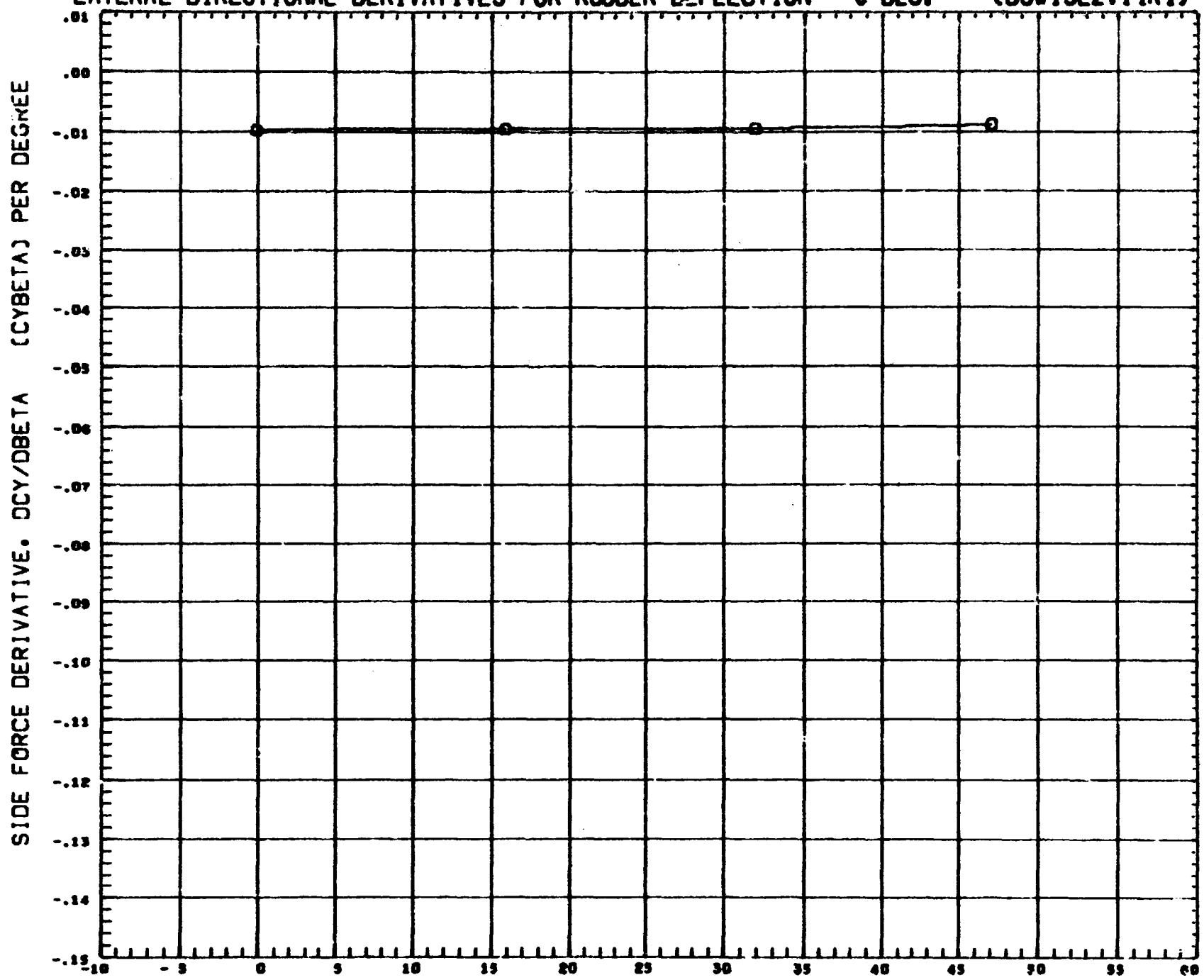


SYMBOL	MACH	PARAMETRIC VALUES			
O	9.000	ELVATR	0.000	AILRON	0.000
		RUDDER	- 10.000	VRTICL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	5.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0039	SCALE

LATERAL-DIRECTIONAL DERIVATIVES FOR RUDDER DEFLECTION = 0 DEG. (B5W13E2V14R4)

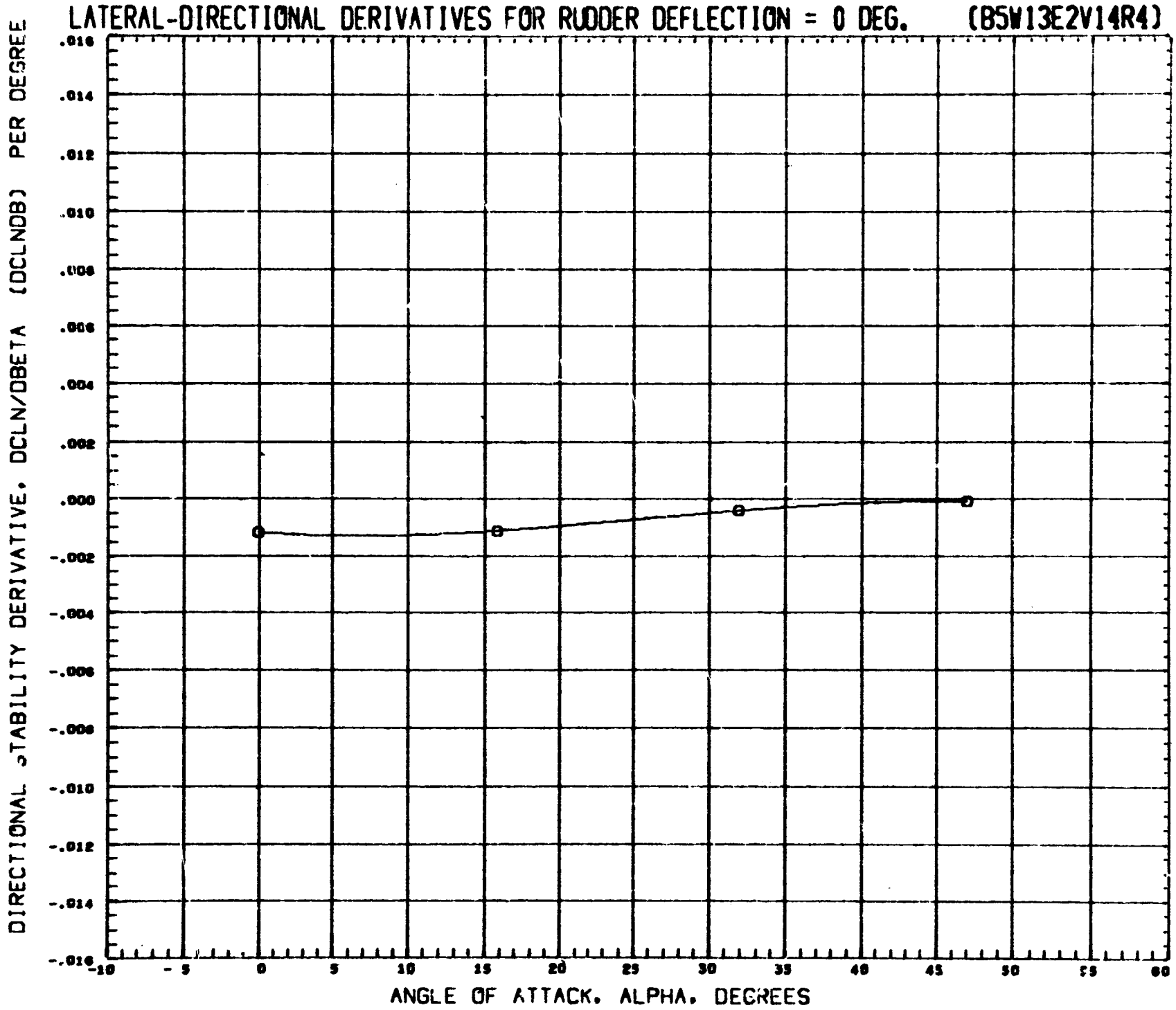


SYMBOL	MACH	PARAMETRIC VALUES			
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

LATERAL-DIRECTIONAL DERIVATIVES FOR RUDDER DEFLECTION = 0 DEG. (B5W13E2V14R4)

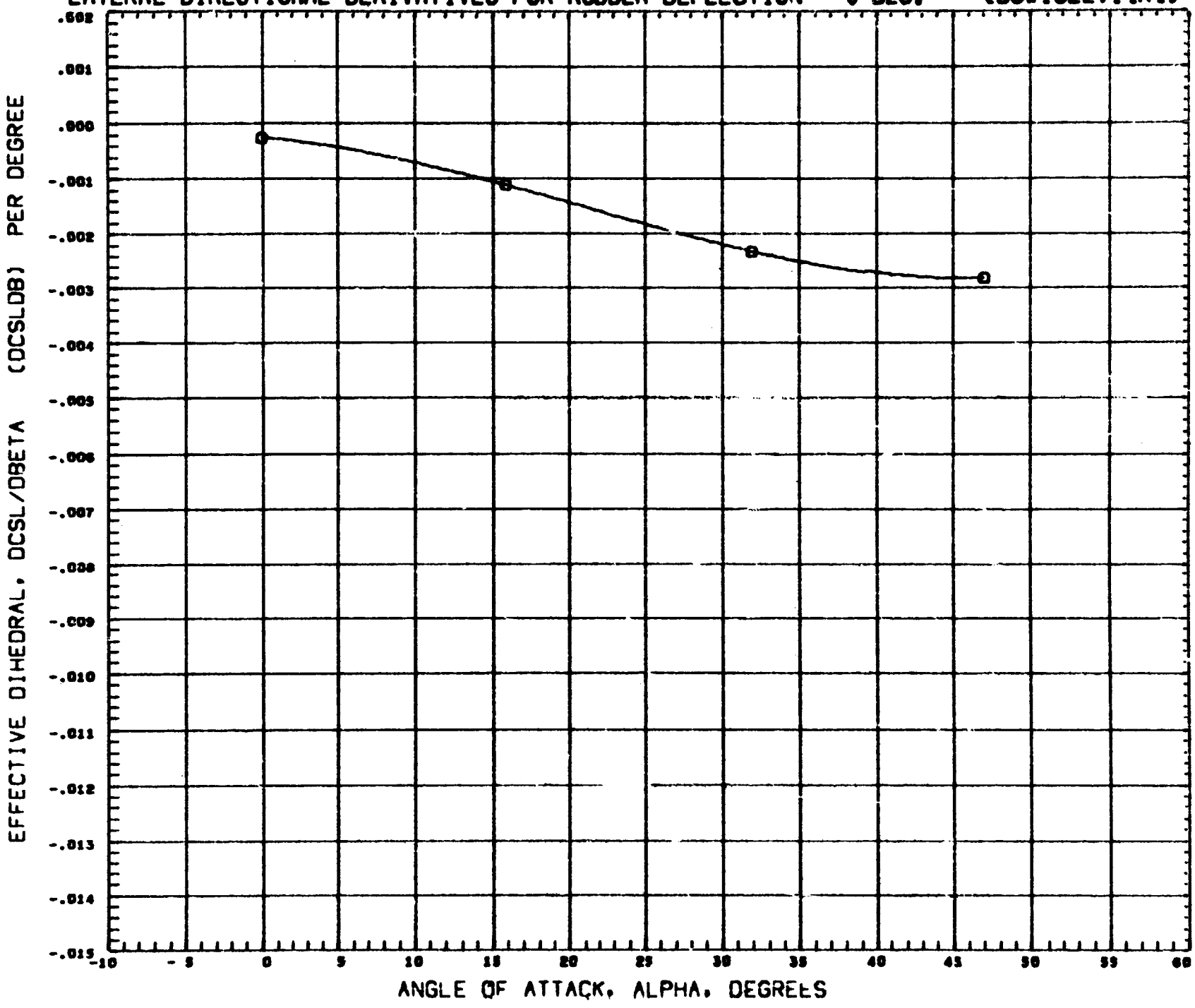


SYMBOL	MACH		PARAMETRIC VALUES		
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.6740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

LATERAL-DIRECTIONAL DERIVATIVES FOR RUDDER DEFLECTION = 0 DEG. (B5W13E2V14R4)

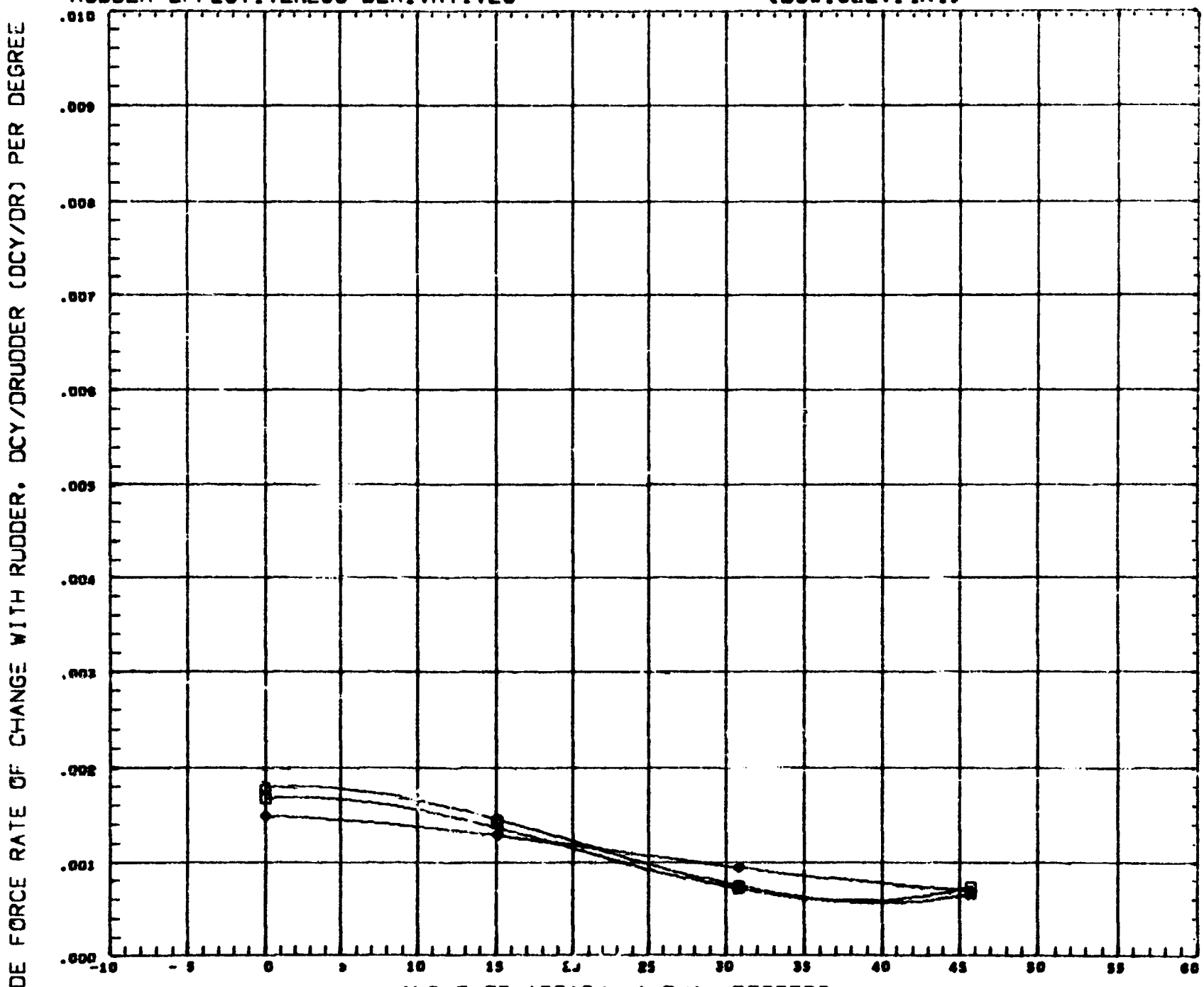


SYMBOL	MACH		PARAMETRIC VALUES		
O	5.000	ELVATR	0.000	AILRON	0.000
		RUDDER	0.000	VRTICL	0.000

REFERENCE FILE NA 70 446

REFERENCE INFORMATION		
REFS	18.7320	SQ INC
REFL	2.0740	INCHES
REFB	4.9800	INCHES
XMRP	4.0720	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4330	INCHES
SCALE	0.0035	SCALE

RUDDER EFFECTIVENESS DERIVATIVES (B5W13E2V14R4)

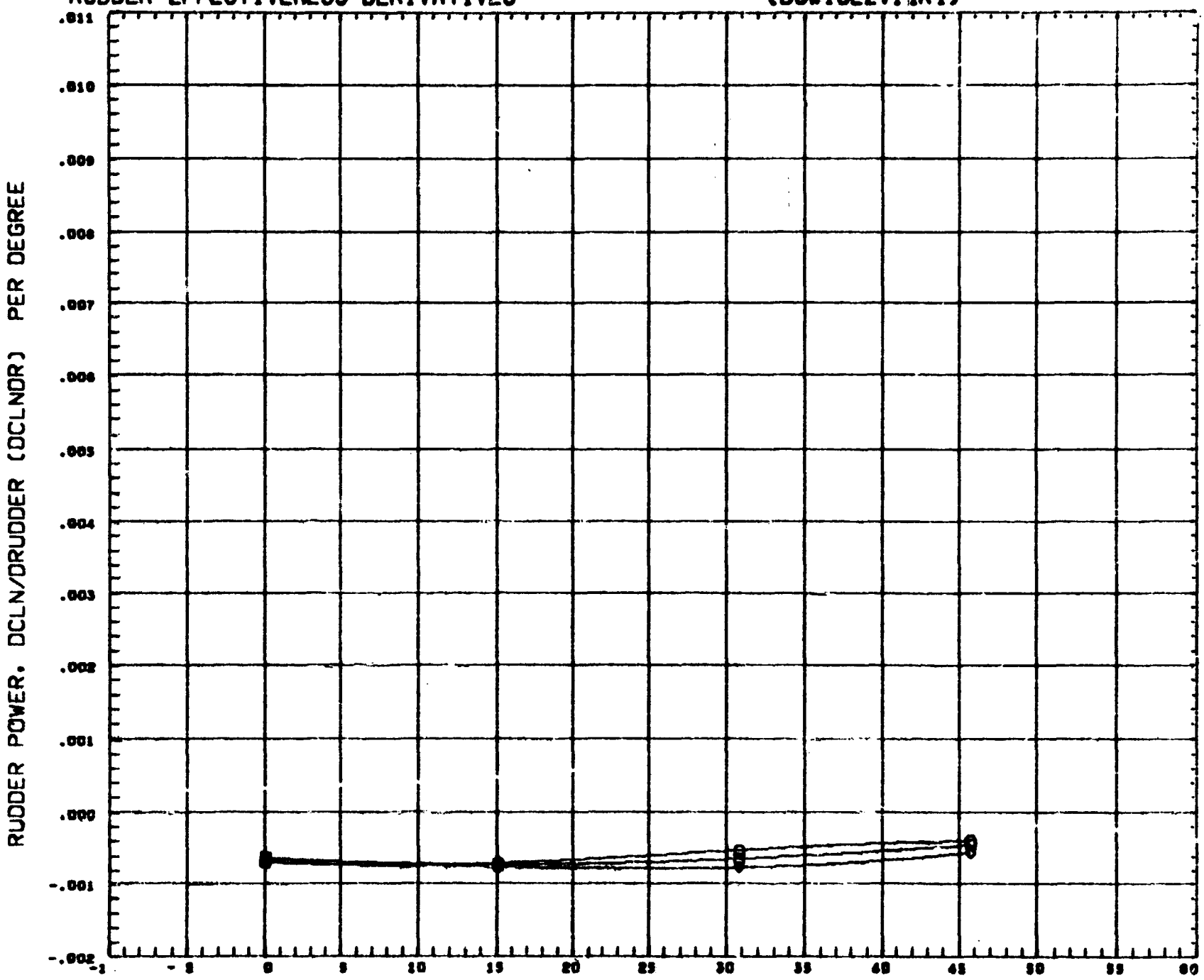


SYMBOL	BETA		PARAMETRIC VALUES		
○ □	0.000	MACH	5.000	ELVATR	0.000
□	4.000	AILRON	0.000	RUDDER	- 20.000
◇	10.000	VRTICL	0.000		

REFERENCE FILE

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9800	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

RUDDER EFFECTIVENESS DERIVATIVES (B5W13E2V14R4)

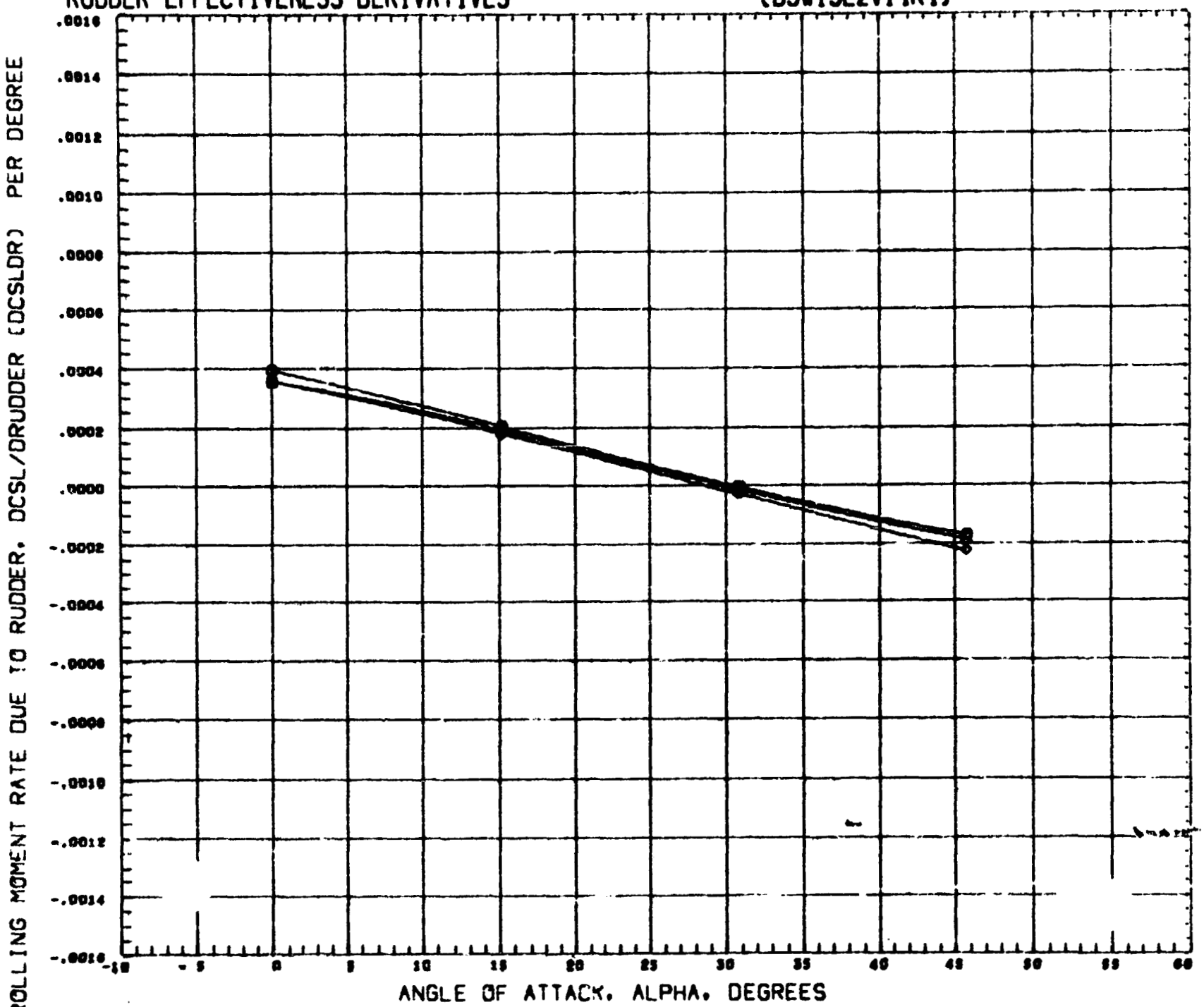


SYMBOL	BETA		PARAMETRIC VALUES		
○	0.000	MACH	5.000	ELVATR	0.000
□	4.000	AILRON	0.000	RUDDER	- 20.000
◇	10.000	VRTICL	0.000		

REFERENCE FILE

REFERENCE INFORMATION		
REFS	10.7320	SQ INC
REFL	2.8740	INCHES
REFB	4.9000	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4550	INCHES
SCALE	0.0035	SCALE

RUDDER EFFECTIVENESS DERIVATIVES (B5W13E2V14R4)



SYMBOL	BETA		PARAMETRIC VALUES		
◇	0.000	MACH	5.000	ELVATR	0.000
□	4.000	AILRON	0.000	RUDDER	- 20.000
○	10.000	VRTICL	0.000		

REFERENCE FILE

REFERENCE INFORMATION		
REFS	10.7320	SQ INCHES
REFL	2.5740	INCHES
REFB	4.9000	INCHES
XMRP	4.9790	INCHES
YMRP	0.0000	INCHES
ZMRP	0.4530	INCHES
SCALE	0.0035	SCALE